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# ADDRESSES AND ORIGINAL ARTICLES

## MATERNAL DISABLEMENT.*

By W. Blair Bell, B.S., M.D. Lond., F.R.C.S. Eng., P.C.O.G., Hon. F.A.C.S.,

OBSTETRICAL AND GYNÆCOLOGICAL SURGEON, ROYAL INFIRMARY, LIVERPOOL; AND PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY IN THE UNIVERSITY OF LIVERPOOL.

### LECTURE I.

Although for many years the obstetrical world and those boards and government departments which are concerned with the health of civilised nations have produced statistics, reports and memoranda relating to maternal mortality, isolated remarks only have found publicity regarding maternal disablement.

That over 3000 women die annually in England and Wales, and that they die in similar or in even greater numbers in other countries, as the result of complications associated with childbearing is a fact so distressing, it seems, that other eventualities are forgotten, or are relegated to the background as being of lesser importance. It is generally believed that maternal deaths are largely preventible, and should be prevented. How much truth there is in this assertion it is not my task to analyse to-day; but I may, perhaps, say that, since those deaths are tragedies where there should be rejoicing in the consummation of a natural event, it comes about that even though the mother escape with her life after grave difficulties have arisen, this happy issue is liable to obscure subsequent disabilities which persist, sometimes to "dog her footsteps" for life, sometimes causing little immediate discomfort, yet leading to her death many years later. It is the urgent, the dramatic, that affects: the long-drawn-out is too often regarded as inevitable—a pleasing alternative to "something worse." So it is that each year at least 60,000† women—that is, 10 per cent. of all mothers—are more or less crippled (for this is what "maternal disablement" means) as the result of childbearing.

It has seemed well, therefore, to explore as far as is at present possible this further burden of our womenkind—chronic ill-health, continued suffering, and, perhaps at some remote time that separates it from the immediate cause, death—in the hope that if attention be focused on this pathological aspect of maternity some serious consideration may be devoted to organised prevention and treatment. With the assistance of my gynæcological friends, I have had investigations made—necessarily of a limited number of cases—to discover, so far as possible, the proportion of all parous women presenting themselves for treatment of lesions due to pregnancy and parturition or exacerbated thereby, in comparison with those suffering with other gynæcological disorders. Out of 2275 consecutive parous women recently examined in the gynæcological out-patient department at the Royal Infirmary, Liverpool, no less than 775—that is, 34 per cent.—had lesions, constitutional or local, which were directly attributable to pregnancy and parturition and caused disablement. I am much indebted to my house surgeon, Mr. Arthur Bell, who collected these figures and made a full analysis of them. Unfortunately space forbids inclusion of the complete statistics here.

Such figures do not, of course, give an exact estimate of the damage that results from the exercise of the natural functions of reproduction. On the one hand, they represent only the more serious for which women seek advice; and, on the other, until we have standardised records of a number of pregnancies and labours of all kinds, with postnatal details—such as might be possible under an efficient national scheme—we shall never be able to obtain exact records of disablement, especially of that type of which the patient is ignorant or which she tolerates, for example, laceration of the cervix, a lesion that in the long run may be of vital importance.

It cannot be too clearly emphasised, as I have insisted elsewhere,[4] that the reproductive functions and processes are dependent on a woman's individual metabolism, and therefore are associated with her physical and mental functions. So it comes about that pre-existing pathological conditions may be accentuated, or lesions may be initiated by gestation, parturition and the puerperium.

It will be convenient first to group our remarks under these two heads, although there must obviously be some overlapping, and then briefly to touch upon the sociological aspects of motherhood, in so far as they affect maternal disablement, and on some of the general principles of prevention and treatment. Last of all, I shall venture to suggest an efficient organisation for the avoidance and alleviation of these disabilities, as well as for the reduction of maternal mortality.

In order to avoid repetition in regard to those lesions which may not only be pre-existent and adversely influenced by pregnancy, parturition, and the puerperium, but may also be brought into existence by these natural functions, it will be better to consider them at one and the same time.

### Conditions made Worse or Initiated by Maternal Functions.

#### NERVOUS DISORDERS.

I shall make no attempt to separate the neuroses from the psychoses, for no doubt some of the former are partly dependent on loss of higher control—for example, chorea.

The most important true psychical disturbances are mental shock and puerperal insanity. The causal factors of these two conditions seem to be entirely different.

*Mental shock* is traumatic in origin, and resembles the state sometimes produced by a severe surgical operation. Crile and Lower [3] have shown that changes in the cells of the higher centres in the brain are visably affected by severe trauma, when histologically examined, and that recovery may be slow. This condition is somewhat rare owing, no doubt, to the natural adjustments of the maternal mentality to the ordinary and inevitable unpleasantness and pain of parturition. It is only to be expected, however, that with the evolution of the human mind, and the apparently increasing difficulty of parturition, the mental resilience should occasionally be overwhelmed. Indeed, we should be glad, even though surprised, that this is not commoner. When the disaster occurs, it is seen, almost invariably, after the first confinement, and the condition may lead to serious consequences. The patient loses her *joie-de-vivre* and becomes apathetic. Towards her husband she becomes indifferent, and though she often has the normal maternal love for her child, she definitely

* The Ingleby lectures delivered in the University of Birmingham on May 21st and June 4th, 1931.

† No exact figure can be given, but the statistics obtainable, and the yearly proportion of primigravida (? 1 4), make 60,000 a moderate figure in this connexion.

avoids, if she can, further conception. Her bodily health may be quite satisfactory.

This condition is, I think, rarely seen when the pains of labour have been adequately controlled by anæsthesia. It almost always follows prolonged labour with severe pain borne, perhaps, with fortitude by a woman of high mental development. It is clear that if this tragic event were of more common occurrence the case for anæsthesia, at any rate in primigravidæ, would be made even stronger than it is at present.‡

Whereas mental shock may occur in an apparently healthy woman with no psychopathic family history, it is otherwise with *puerperal insanity*, for it is found that in about half of all such cases the patient has an hereditary psychical taint. Yet it is believed, almost universally, that there is always a determining factor of a toxæmic nature, such as that produced by a bacterial infection or chemical auto-intoxication, with which eclampsia may have been associated.

Puerperal insanity is not uncommon, for it has been found in one case in every 616 labours by H. J. Berkley,[5] and in one in every 1100 labours by R. Jones.[16] The disturbance, accompanied as it often is by homicidal and suicidal tendencies, is well worthy of more attention than is usually given to it, especially when we remember that some 30 per cent. of the patients fail to make a complete recovery, and that 15 per cent. die. Since this condition usually supervenes on a toxæmia in women with a psychopathic family record, it is of great importance that the psychological history should always be included in the antenatal history.

Of the neuroses we need only consider here *chorea gravidarum*. In this serious disturbance a past history of rheumatism, with or without chorea, in childhood is obtained in a majority of the patients, according to French and Hicks.[10] Wall and Andrews [23] concluded that strain and worry play a large part in the causation. The onset in half the cases is during the first three months of pregnancy, and the commonest age appears to be between 19 years to 24 years.[7] As Fletcher Shaw [22] states, chorea, which is probably of toxic origin, occurs in girls and young women at age-periods of irritability and instability. In patients in whom a maniacal psychosis develops death generally supervenes.

### CARDIAC, VASCULAR, AND HÆMATOLOGICAL LESIONS.

Pre-existing lesions in this sytem are nearly all adversely affected to a greater or lesser degree by pregnancy and parturition.

The subject of *heart disease* in pregnancy and parturition is one which has received much attention at the hands of cardiologists since Mackenzie [18] first so carefully studied this question. The most recent contributions to the subject in this country are those of John Hay and of Crighton Bramwell. In 1928 Hay and Hunt [14] published a paper on Pregnancy and Parturition in Patients with Crippled Hearts, in which they described an investigation of 50 consecutive cases. Of these five died: all had mitral stenosis, two with slight aortic regurgitation, and in one there was auricular fibrillation and a "large white kidney." These authors call attention to the gravity of associated renal damage. Crighton Bramwell [6] recently based a paper on the study of 82 cases in which heart disease was associated with pregnancy. These were derived from 3000 antenatal patients, and three who had been sent as emergencies —that is, about 2·7 per cent. of all cases of pregnancy attending an antenatal clinic. Of the 82 patients five died. Bramwell was able to follow 66 of the women who got over the confinement safely, and found that in three at least the cardiac condition had been made much worse by pregnancy and parturition. Consequently about 10 per cent. of these patients lost their lives or were permanently disabled.

Leyland Robinson [20] has published an account of 18 cases of heart disease with auricular fibrillation, of which as many as 13 proved fatal as the direct result of parturition. These cases did not receive adequate, if any, antenatal care.

Arising out of this brief summary of recent work on heart affections and pregnancy, coupled with my own experience, I think it is clear that mitral stenosis, with and without aortic regurgitation, and especially when associated with auricular fibrillation, is a very grave disease in pregnancy. I myself have been impressed by the liability to a very sudden break in compensation during gestation without any warning—and this even though the patient be in bed and in hospital. Moreover, it is obvious from such figures as those of Robinson that uncared-for cases with fibrillation have but a small chance of surviving parturition. Renal complications add to the danger, and these may be due to a toxæmia of pregnancy. The greatest antenatal care with rest and good nursing seems to afford the best chance for these patients. The question of the artificial termination of pregnancy by induction or Cæsarean section may require consideration in many cases, but each must be judged on its merits. One advantage Cæsarean section with spinal anæsthesia offers over induction of labour is the opportunity for sterilisation. Whether any patient seriously crippled in this way, and further crippled by pregnancy and labour, should be allowed to face another conception in her disabled state is not difficult to determine.

*Vascular lesions* to which pregnancy may be assigned as an aggravative and also a causal factor are arterio-sclerosis following renal disease, pre-existing or the result of pregnancy toxæmias, and varicose veins of the lower extremities, the vulva and rectum. The former may, after the patient has passed a life of invalidism lead to death, and the latter may prevent a working woman from carrying out her duties.

*Hæmatological disturbances*, apart from secondary anæmia from excessive loss during parturition, need no consideration here. Stress must, however, be laid on the serious ill-health that may be associated with secondary anæmia in mothers, especially those of the working classes.

### RENAL AFFECTIONS OF TOXIC ORIGIN.

Renal affections, whether due to a pre-existing nephritis or to a toxæmia of pregnancy, with or without the supervention of eclamptic seizures, are a very grave complication of pregnancy, not only in respect of the first gestation, but also because recurrence in subsequent pregnancies is likely; and, as we have seen, lesions of the kidneys militate against the chances of the mother when associated with cardiac abnormalities.

James Young [28] has found that severe toxæmias, with albuminuria and eclampsia, recur in 31·9 per cent. of subsequent pregnancies with added risks; and that if recurrent toxic albuminuria without eclampsia be superimposed the percentage of similar disability in subsequent pregnancy is raised to 57 More recent unpublished figures with which Dr

‡ I shall not refer here to the important condition known as obstetrical shock, which has recently been ably discussed by Miles Phillips, for this resembles ordinary surgical hock and is usually followed by death or recovery, and not by disablement.

James Young and Dr. Elsie Crowe have kindly supplied me, show that the incidence of toxæmia in 7790 patients examined in routine antenatal clinics in Edinburgh is 6 per cent. of unselected cases—that is, excluding those which are specially referred for this condition—and that about 40 per cent. of these require admission to hospital. Further, they have found that of 96 cases of pre-eclampsia and 10 cases of hypertension, watched for an average time of eight months following childbirth, apparent recovery took place in 40 per cent., and there was subsequent impairment in 60 per cent., and that of the latter in 37·5 per cent. their health was "shattered." In recurrent toxæmia there was impaired health in 73·5 per cent. of all patients, including "shattered" health in 58 per cent.—a very high disability-rate. When eclampsia supervened there was subsequent impairment of health in 63 per cent. of the patients, including "shattered" health in 14 per cent.

A general average of all forms of disability due to toxæmic causes, including associated accidental hæmorrhage, in a total of 151 patients showed that 60 per cent. of all patients suffered with impaired health, a figure which included 31 per cent. with "shattered" health.

Greenhill [13] found that 43 per cent. of a series of women who had suffered with eclampsia were again afflicted with a similar condition in a later gestation. Gibberd [11] noted that in 28 cases of albuminuria there was a toxæmia subsequently in 68 per cent. of those who conceived. Moreover, Gibberd states that chronic nephritis may arise *de novo* as a sequel to albuminuria of pregnancy. The frequency with which this permanent damage occurs is stated to be 57 per cent. of all cases of albuminuria of toxæmic origin. It is only to be expected, therefore, that the woman who already has chronic nephritis comes to pregnancy damaged, and is likely to suffer further damage, with cardiorenal embarrassment, as the result of additional stress produced by this function, if nothing more tragic occurs.

Prof. F. J. Browne, also, has been good enough to furnish me with some interesting and instructive figures on this subject. Of 38 patients suffering with eclampsia or pre-eclampsia, 16 have subsequently shown evidence of chronic nephritis—that is, 42 per cent. Of 60 patients with albuminuria of pregnancy eight had chronic nephritis—that is, 13 per cent. But of ten cases of accidental hæmorrhage, in none was chronic nephritis subsequently found. An insufficient number of Prof. Browne's cases have subsequently become pregnant to allow conclusions to be drawn concerning the frequency of the recurrence of toxæmia in this series. We have, however, once more evidence of the serious renal damage which is caused by severe toxæmias of pregnancy.

### HORMONOPOIETIC SYSTEM.

Since there appears to be what I have described [2] as a "genital system of ductless glands" on which are dependent all the sexual functions, it is easy to understand that pregnancy may initiate derangements or influence pre-existing lesions in any member of this system. The chief organs with which we are concerned in this connexion are the thyroid and the pituitary. Concerning the other organs of internal secretion which may also be involved, for example, the ovaries and suprarenals, we have no evidence that they are directly and alone affected.

*The Thyroid.*—The clinical types of lesions of the thyroid with which all are familiar, are the toxic, including the exophthalmic goitre, the hyperplastic, and the hypoplastic. There is a certain degree of normal enlargement of the thyroid during pregnancy. This appears to be due to hyperplasia and increase in the colloid secretion. Sometimes the enlargement is considerably in excess of the normal and Bignami—quoted by Whitridge Williams [27]—has recorded a case in which this occurred in a first pregnancy, after which retrogression took place. In her second pregnancy the condition recurred, and the patient died of suffocation. I have recently seen a patient in whom exophthalmic goitre originated during pregnancy, but was greatly relieved by treatment with X rays, although a neurosis has persisted.

There is no difference of opinion concerning the exacerbation that may occur in goitres of toxic nature during pregnancy. Clifford White,[24] in 1911, in a critical review concerning exophthalmic goitre and pregnancy, labour and the puerperium, concluded that:—

> "Pregnancy is an important factor in the ætiology of the disease, and on the whole makes it worse. The patients may pull up lost ground towards the end of pregnancy, but are again made worse by the labour in a good many instances. Improvement during the puerperium is usual, and occasionally even a cure may take place. Relapses during subsequent pregnancies are to be expected."

White says nothing about fatal issues which have not been uncommon; but he calls attention to the liability to postpartum hæmorrhage. Seitz [21] in 1913 collected 112 cases of exophthalmic goitre of various grades, and noted aggravation in 60 per cent., and a fatal issue in seven patients.

*Atrophy of the ovaries* with superinvolution of the uterus has been noted in cases of thyroid disturbance, but may occur independently of recognisable lesions in that organ: I have seen a certain number of cases of this kind, and two are to be found among our 775 cases of maternal disablement. The condition is sometimes described as "lactation atrophy," and has, therefore, been observed when lactation has been unduly prolonged, as is sometimes practised in the poorer classes in the hope—often falsified—that conception may thereby be prevented.

The *pituitary*, as has long been known, shows great activity in the anterior lobe in pregnancy.[3] This may lead to symptoms and signs of acromegaly with glucosuria, and be followed by sterility and by a permanent change in the appearance of the woman.

*Pancreas.*—Although glycosuria occurs in the last few weeks of pregnancy as the result of the formation of lactose for mammary excretion, this should not be mistaken for glucosuria, which is seen only with disturbances of the pituitary and pancreas. I have already referred to the pituitary, and there should be no difficulty about the diagnosis of true diabetes.

Pancreatic diabetes is usually held to be a most serious complication of pregnancy. Williams [26] states that of 66 cases which he had collected from the literature, 27 per cent. of the mothers died at the time of labour or within two weeks afterwards, while a further 23 per cent. were dead within two years of the confinement. There is, moreover, the greater predisposition to infection [17]—a liability borne by all diabetics. Modern treatment with insulin and by dieting has to some extent reduced the danger of diabetes in pregnancy, but it is still one of the most serious constitutional complications.

### BACTERIAL INFECTIONS.

Although pregnancy, parturition, and the puerperium are all responsible for the aggravation of chronic bacterial conditions, and may even determine adversely the outcome of acute infections, such as pneumonia and infective endocarditis, the local

infections that may appear in the puerperium are nearly always due to the artificial introduction of organisms. In a few cases, however, the local lesions may be associated with septic infections of the ears, teeth, and elsewhere: this is known as auto-infection. These local infections we shall consider later. Infection from the vagina should not be regarded as auto-infection.

In the category which we are now studying I shall mention only chronic infections of the teeth, including caries, tuberculous lesions of the lungs (phthisis), and those of the urinary tract.

*Dental lesions* are of great importance, and a proper examination and hygienic treatment of the mouth is most necessary in practically every case during the antenatal period. As I have just stated, untreated dental infections may lead to puerperal sepsis, and, short of this, the mother may subsequently suffer the loss of teeth no longer amenable to conservative treatment.

Apart from infections, or superadded thereon, is the very common type of caries that is associated with gestation. This appears to be chiefly due to a disturbance of the calcium metabolism, which, in a sense, is normal to pregnancy. Throughout the whole nine months of gestation calcium is urgently required by the mother as an alkaline base to prevent acidosis, for cardiac and nervous stability, and for the integrity of her skeletal—including dental—structures. Too rapid and too great depletion may, and not infrequently does, lead to serious consequences in all these respects.

Depletion from the maternal tissues is due to the demands of the developing fœtus. Since the child obtains from the maternal blood about 70 g. of calcium in all, it appears that the mother must part with an average amount of 0·25 g. per diem throughout gestation, but probably as much as 0·6 or 0·7 g. per day during the last eight weeks, and less than 0·25 g. in the early weeks of pregnancy.

Dental caries must be considered both as to prevention by an ample supply of calcium to the expectant mother in milk or in other vehicles, and to treatment by temporary fillings, for it is a very common and most important antenatal disorder. Disregard of this condition leads to much subsequent ill-health, and sometimes to the mutilation of good looks.

*Pyelitis and Cystitis.*—According to Williams, Murray and Wallace,[25] between 25 and 42 per cent. of all gynæcological patients harbour in their urine colon bacillus; and no doubt a few have *Streptococcus fæcalis* also. In normal circumstances, that is to say, when the patient is in good health, these organisms cause no symptom. Whether in these circumstances they produce toxins or not, or how, if toxins be produced, they are neutralised is unknown. When, however, the patient is in ill-health, or when there is local irritation of the urinary organs, cystitis and pyelitis may supervene. Consequently, pregnancy may be associated with pre-existing bacilluria, with or without cystitis and pyelitis, and may aggravate these conditions or initiate them, by mechanical pressure, which may be very considerable with a retroverted gravid uterus, or by a lowering of the general resistance of the patient.

Pyelitis, the graver lesion, is far more common in pregnancy than is generally appreciated; but it is a complication of, rather than specifically associated with, pregnancy. It is more accurate, I believe, to speak of "pyelitis *in* pregnancy," than "pyelitis *of* pregnancy."

Prof. F. J. Browne has kindly sent to me the following particulars concerning 77 pregnant and puerperal patients suffering with pyelitis who were carefully investigated and followed; 41 were discovered in the antenatal period, and 36 in the postnatal. Of the antenatal patients 19 were cured—that is, there was no pus in their urines, and no growths were obtained on culture. Of the rest, 22 in number, 14 continued to have pus in the urine and organisms on culture. The remainder had organisms only. Six of the 41 cases have had subsequent pregnancies, and of these four have shown no evidence of pyelitis. Two have had pyelitis, but in them the condition had persisted between the pregnancies. Of the 36 patients in whom the lesion was discovered in the postnatal period, 20 were cured, and 16 were not cured in the sense given above.

In patients in whom there is persistent bacilluria, subsequent pregnancy, no doubt, as already indicated, may precipitate another attack of pyelitis. However, persistent bacilluria must be regarded in the light already given—namely, that it is present in many women even during pregnancy without producing symptoms, but should be regarded as a source of pyelitis in those whose immunity to the organism is lowered. Immunisation, therefore, should be practised to raise the patient's resistance.

Parturition, during which there may be prolonged pressure on the base of the bladder in the second stage, may so injure the tissues that cystitis supervenes, with or without a fistula forming. It must, nevertheless, be remembered that infection of the urinary tract not infrequently results from impure catheterisation, and that this is most likely to happen in the early days of the puerperium.

It is clear from these few remarks that infections of the urinary tract are often preventible, or may be amenable to prompt treatment.

*Phthisis.*—The effects of pregnancy and the puerperium on tuberculous lesions of the lungs has received a considerable amount of attention in recent times. In a discussion at the Royal Society of Medicine[19] this year attention was called to the statement of Rist, who recorded 52 cases of tuberculous (pulmonary) women who became pregnant. Of these 85 per cent. were made worse by pregnancy, and 50 per cent. had died within two years. Many other statistics were quoted by the speakers. These figures show that taking a large number of cases of the various types, deterioration occurs in about 45 per cent. of all the patients. It seems that when the disease is in an incipient or active phase pregnancy and the puerperium are dangerous periods; whereas when the disease is in a quiescent or healed condition little anxiety need be felt, provided the patient is well nursed, and is suitably fed in a healthy environment. In most cases, however, lactation should be forbidden, for this function leads to a continuation of the withdrawal of large quantities of calcium salts from the maternal economy—salts which are specially employed in reparative processes in connexion with infective lesions.

## NEOPLASMS.

Pre-existing neoplasms, whether in the genitalia or elsewhere, may be considerably affected by pregnancy and parturition.

*Malignant Disease.*—It is commonly believed, in a somewhat general and vague way, that the growth of cancer is augmented by pregnancy, and this is the view of most clinicians. Although there are many contradictory statements to be found in the literature,[9] there can be no doubt that the matter has never been adequately investigated with proper biological perception. If, as I believe, the tissues of a

malignant neoplasm show reversion to the chorion-epithelial type, we should expect that during the early weeks of pregnancy there would be acceleration, to be followed by stasis in the later months, with subsequent reawakening of active growth after parturition. This would correspond with the parental reaction to chorionic invasion; and, in my experience, this is what seems to happen.

We must all have observed the stimulation of a recurrence of mammary cancer by pregnancy—it is a phenomenon surgeons so dread that pregnancy is usually forbidden after operation or abortion effected. It is common to see, also, a great access of growth in a primary malignant tumour early in pregnancy to be followed later by quiescence, and after pregnancy by fresh neoplastic energy.

*Innocent tumours*, unless they be situated in the genitalia, are unaffected by pregnancy or parturition. Not so those in the genital organs and tract. These may be subjected to mechanical injury during pregnancy and labour, as a result of which sloughing may occur in them. I cannot here deal with the surgical treatment of these conditions; it is designed to prevent such serious consequences.

Degenerations, too, are common in fibromyomata, and may necessitate surgical treatment during or after gestation.

## Creation of Local Lesions.

In this group we find the largest number of freshly created lesions due to parturition.

### TRAUMATIC AND INFECTIVE LESIONS.

It is difficult to separate trauma from infection, for the latter so often follows lacerations.

At the Royal Samaritan Hospital, Glasgow, ætiological factors are recorded in the annual reports, and we find that in 1928 and 1929 63 per cent. of all the gynæcological lesions observed were due to parturition, and that 69 per cent. of all operations were performed for the lesions attributed to parturitional trauma and its results, and to infection. As, however, in a number of patients—roughly estimative from the difference between the total number of cases and the number of lesions treated—there was more than one abnormal condition present, we may correct the figures to read that about 48 per cent. of all lesions were due to infection and trauma, and that these were included in 51 per cent. of all operations performed—figures not very different from others which are mentioned below.

I am indebted to Dr. R. Newton, resident surgical officer, and to the honorary staff of St. Mary's Hospital, Manchester, for an analysis of the conditions found in 431 parous women presenting themselves in the out-patient clinic. In 185—that is, 43 per cent.—there were lesions attributable to pregnancy and parturition. Of these 185 lesions, 70 per cent. were due to trauma and infections. There were also 19 patients suffering with carcinoma cervicis.

Dr. G. H. Henderson, gynæcological registrar to the General Hospital, Birmingham, has been good enough, at the request of Prof. Beckwith Whitehouse and Mr. A. B. Danby, to send me the result of an examination of the case-cards of 500 parous women attending the out-patient gynæcological clinic at that hospital. From the records he has given me it appears that 157—that is, 31 per cent.—had lesions made worse or freshly created by pregnancy and parturition. Of these 72 per cent. were suffering with lesions due to trauma and infection. There were 11 also with carcinoma cervicis.

At the Royal Infirmary, Liverpool, I find that during the last six years 47·3 per cent. of all gynæcological operations have been concerned with the relief of local injuries and infections. Moreover, of the 775 disablements found in 2275 consecutive parous women (34 per cent.) seen in the out-patient department, suffering with disablement due to pregnancy and parturition, no less than 80·8 per cent. had traumatic or infected lesions. Among the remaining 148, out of the total of 775 cases of maternal disablement and its sequelæ, were 112 cases of carcinoma cervicis, leaving only 36 due to other causes.

These figures are summarised in Table I.

TABLE I.

| Hospital clinic. | 1 | 2 | | 3 | | 4 | |
|---|---|---|---|---|---|---|---|
| | Parous women whose case-cards were examined. | With lesions created or aggravated by pregnancy and parturition. | | With disability due to trauma and infection. | | With cancer of the cervix. | |
| | Total. | Cases | Per cent. of total. | Cases | Per cent. of cases in Col. 2. | Cases | Per cent. of cases in Col. 2. |
| St. Mary's, Manchester | 431 | 185 | 43 | 130 | 70 | 19 | 10 |
| General, Birmingham | 500 | 157 | 31 | 114 | 72 | 11 | 7 |
| Royal Infirmary, Liverpool | 2275 | 775 | 34 | 627 | 81 | 112 | 14·5 |
| Total cases and percentages .. | 3206 | 1117 | 34·5 | 871 | 78 | **142** | 12·5 |

Of the 1117 cases of trauma and infection shown in the above Table, only 169 cases—15 per cent.—were recorded as infections apart from cervicitis following laceration.

Disregarding the large number of acute infections, and taking into consideration only those found as subacute and chronic lesions in the pelvis in the postnatal periods, and putting aside infections of the breast and urinary tract, we have obtained the figures shown in Table II. from the total number of 775 cases of maternal disablement:—

TABLE II.

| | | |
|---|---|---|
| Cervix: | Chronic cervicitis .. .. .. .. | 34 |
| Body of uterus: | Chronic endometritis .. .. | 2 |
| | Abscess in uterine wall .. .. | 1 |
| Fallopian tubes: | Chronic salpingoöphoritis .. | 74 |
| | Subacute salpingoöphoritis .. | 10 |
| | ,, pyosalpinx .. .. | 16 |
| | ,, tube ovarian abscess | 2 |
| | ,, ovarian abscess .. | 3 |
| Pelvic cellulitis | .. .. .. .. .. | 15 |
| ,, | ,, with abscess .. .. .. | 1 |
| Pelvic peritonitis | .. .. .. .. .. | 2 |
| Thrombosis of pelvic veins | .. .. .. .. | 2 |
| | | 162 |

With regard to the 34 cases of chronic cervicitis shown in this Table, in them this was the only lesion recorded. As already indicated a large majority of all lacerations become in some degree infected, and are associated with other lesions, especially displacements of the uterus and vagina.

It is interesting to contrast with these British figures statistics which Prof. Essen-Möller has been kind enough to send me from Sweden. Out of 1000 consecutive cases confined in 1929, only three have subsequently sought relief for parturitional trauma, that is, 0·3 per cent. Again, out of 1000 consecutive parous out-patients there were but nine cases of trauma and four cases of infection due to parturition, that is, 1·3 per cent. It is true that retroversions and simple

lacerations of the cervix are not included in these figures; nevertheless they bear out remarks I shall have to make later concerning obstetrics in Sweden.

Of the local lesions those resulting from trauma are, then, of the greatest frequency and importance. They may be encountered at the time of injury, or at a remote period, when the results of injury and often of subsequent infection become evident. These lesions concern the uterus and cervix, the vagina and adjacent organs—the bladder, ureters and rectum—and the perineum.

Rupture of the body of the uterus, as the result of manipulative interference, is not uncommon, but this catastrophe is related to the maternal mortality rather than to maternal disablement.

Not so, however, with lacerations of the cervix. Here we have an open wound which may become infected at once and cellulitis follow. More often we have the train of symptoms associated with chronic cervicitis, and in some cases the long-continued disablement pictured by James Young,[29] although such a serious state as a result of cervicitis alone is not, I believe, very common. Rather is it the ultimate result that may be serious—namely, cancer of the cervix.

Out of the 2275 parous women examined in my clinic, 139—6 per cent. of all the parous women investigated—had *bad* lacerations of the cervix, often, of course, associated with other lesions, and most of these cervices were infected, but it is probable that there were many more. Of 500 parous women examined in Birmingham, 43 are recorded as having badly lacerated cervices, but probably similar injury occurred in many of the cases of prolapse, but are not recorded. In Dr. Young's clinic in Edinburgh, out of a total of 1214 gynæcological cases, chronic cervicitis with and without other lesions, such as prolapse, occurred in 13 per cent. of parous women.

Still, we have no means of knowing how common are lacerations, especially the minor grades, of this part. It is believed that most primipara have some degree of cervical injury.

### CARCINOMA CERVICIS.

In England and Wales about 4000 women die annually of cancer of the cervix alone, of whom at least 3800—that is, 95 per cent.—have borne children. It seems, therefore, that parturition, with cervical laceration and infection, is a very definite predisposing factor of malignant disease in this site—and it is the immediate effect of a single parturition rather than the result of repeated childbearing.[15] §

This annual death-roll should be added to the toll of maternity.

We have interesting and significant evidence of the value of the surgical treatment of the lacerated cervix in the figures published by Prof. W. P. Graves,[12] of Harvard University, and given below.

*Cancer of the Cervix in Parous Women.*

| | |
|---|---|
| Number examined | 488 |
| Number in which repair of the cervix had been performed | 9* |

*After-history of Cases in which Cervical Repair had been Practised.*

| | |
|---|---|
| Number examined | 4815 |
| Number in which cancer had developed subsequently | 4† |

* Operations performed many years previously and probably with poor technique.

† In two of these four cases there was evidence that the operation had been badly performed.

Strictly speaking, to complete the comparison we require to know also in how many untreated lacerations of the cervix malignant disease does not develop. Such figures have never been obtained and probably never will be, for the patients would require watching for the rest of their lives. Yet I hope the time will come when few lacerated cervices will escape treatment. I called attention to the importance of this over 20 years ago.[1]

As already stated, the large majority of all cases of cervical injury in which surgical intervention is practised are associated with lesions of the vagina and levatores ani, with various types of prolapse, or with puerperal retroversion. These conditions are most crippling, but fortunately are amenable to skilled gynæcological surgery. Fistulæ between the bladder and vagina and rectum and vagina, and complete lacerations of the perineum, also, are not uncommon.

## Sociological Considerations.

I shall but briefly touch on the sociological aspect, for it is concerned largely with economic difficulties and with the evils attaching to poverty and ignorance. It is obvious that such conditions are more apparent in large towns than in country districts. Crowded homes, poor feeding, indiscriminate sexual intercourse, especially late in pregnancy, and the absence of personal hygiene and cleanliness are matters for serious consideration.

It goes without saying that the pregnant and puerperal woman needs good fresh food, with fresh air and sunshine. The development of our knowledge of the action of vitamins in relation especially to the anti-infective action of vitamin A, and the influence of vitamin D on the calcium metabolism make it imperative that pregnant women in the antenatal period should be provided with foodstuffs rich in these substances, and also receive daily at least one quart of milk which contains 1·0 g. of calcium in an available form; this should give an adequate supply of this essential element. All this is now well known and to some extent applied in connexion with antenatal work; but very often in the antenatal period it is too late to deal effectually with antecedent affections in early life which have seriously handicapped a woman's reproductive capacity.

## Prevention and Treatment of Maternal Disablement.

The prevention and treatment of many of the constitutional and local conditions responsible for maternal disablement are difficult matters for, as I have just stated, the causal factors—for example, rheumatism and rickets—often go back to the early life of the woman concerned. In the ideal national health scheme the individual will be watched from the neonatal period through childhood to adolescence; rickets due to unhealthy environment, lack of sunshine, and bad feeding will disappear, and with it a considerable proportion of cases of contracted pelvis; imperfect pelvic development, too, will receive attention; orthopædic lesions of the lower extremities and back will be so managed as to obviate distortion of the bony canal; cardiac lesions will be prevented or treated early, and infections, which may produce permanent constitutional, such as renal, and local pelvic lesions unfitting women for maternity, will also be taken into account from this point of view.

No doubt much else can be done, but these are examples which indicate the necessity of long-continued care in the case of all women, for no one knows which will become mothers, all of whom should be in group A1, not in group C3, in a health classification. I believe that the fact that in Sweden most mothers are sound and healthy accounts almost

§ I am indebted to Sir George Newman for information on this subject.

entirely for the low rate of mortality and disablement in that country.

I hold such considerations to be a most important part of any national maternity scheme, for, as I have already said, antenatal observation is only of relative value—great as that is—and postnatal investigations do little more than enable us to discover and to repair some of the damage caused by pregnancy and parturition.

With regard to constitutional lesions discovered in the antenatal period, there should always be arrangements whereby experts can be consulted; for many of the conditions are merely associated with pregnancy, although adversely influenced thereby. Close coöperation in these matters can be secured only in a perfectly organised scheme, and in relation to large consultative centres. With these matters I shall deal in my next lecture.

The prevention of the local injuries and infections, which constitute at least 75 per cent. of all causes of maternal disablement, at present lies in the hands of the obstetrician and the nurse-midwife. Much can be done by careful antenatal anticipation, but even more will be accomplished by ensuring the production of a healthy maternal population. Meanwhile, good and up-to-date midwifery must play an important rôle. Such disregard as is shown by some of the frequency of contraction of the outlet in otherwise normal pelves, which leads to a large proportion of all complete lacerations of the perineum, and such lack of knowledge or appreciation by most of the value of efficient and proper massage and purification of the vagina to prevent laceration and infection in difficult cases, and of *skilled* radiography, are clear indications that even the obstetrician himself may have mental obfuscations concerning additions to our knowledge. No one of us is free from blame in this respect, and we must realise it in all humility before we attempt to apportion the responsibility for the terrible rôle of disablement that follows in the wake of motherhood.

### Summary.

1. While 3000 women die annually in England and Wales from the direct results of maternity, probably, at a most conservative estimate, 5000 die from the late results of childbearing, including cancer of the cervix. That is to say, more than 8000 women are lost annually.

2. At least 60,000 parous women, also, are crippled annually, many gravely, others, though less seriously injured, enough to cause ill-health and disablement.

3. Constitutional disorders form an appreciable percentage of all cases; and they are more immediately serious than local lesions, apart from acute sepsis.

4. Trauma and infection are often associated, and comprise about 75 per cent. of all causes of disablement. In the present conditions with proper preventive obstetrics and by skilled reparative surgery the disablement from trauma and infection could be much reduced.

5. To mitigate such a state of affairs as that described we must go further back than the antenatal period, and ensure a supply of healthy mothers by watching women from the neonatal period of life to maturity.

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(*Continued at foot of next column.*)

## STUDIES ON NUTRITION IN RELATION TO IMMUNITY.*

A PRELIMINARY COMMUNICATION.

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FROM the earliest times it has been commonly believed that susceptibility to disease is affected by the quantity and quality of the food, and considerable justification for this belief has been afforded by the appalling increases in disease which followed many of the not infrequent famines throughout the ages. Modern work on nutrition with groups of animals on controlled diets is supplying more definite information. It has repeatedly been noted that susceptibility to infections, especially of the respiratory system and intestinal tract, is greater among animals on a deficient than on a complete diet, and such data as are available suggest that a similar connexion between diet and susceptibility to infection exists in human populations.

In studies on experimental animals it has been found that, when the diet is so deficient as to lead to the development of nutritional disease, changes occur in the tissues and body fluids which may be so marked that they can be detected by microscopic

* This investigation was carried out under the supervision of a subcommittee of the Imperial Advisory Council, formerly the Civil Research Council. This subcommittee was appointed by the late Lord Balfour in 1926. On its recommendation a grant-in-aid for the work was obtained from the Empire Marketing Board. A number of workers have been engaged on the different aspects of the investigation. The chief part of the work on the investigation in Kenya was done by the late Dr. J. M. Henderson and Dr. J. W. Foster; the early work on sheep by Major Walter Elliot, chairman of the above subcommittee, and Mr. A. Crichton. Since 1929 the main workers have been Dr. A. H. H. Fraser and Mr. G. J. Jamieson, organisation of sheep experiments and clinical observations; Mr. D. W. Auchinachie, biochemical work; Miss E. J. M. Anderson, serology; Mr. W. A. Carr Fraser, of the Council of Scientific and Industrial Research, Australia, hæmatocytology; and Mr. W. Godden, chemistry of pastures.

(*Continued from previous column.*)

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examination or chemical analysis. A well-known example is the abnormal level of serum calcium and blood inorganic phosphorus in rickets. These changes, when compared with observations on the incidence of disease in experimental animals on restricted diets, and on human populations under abnormal dietary conditions, afford evidence that the resulting perverted metabolism is accompanied by derangement of the defence mechanisms and reduced powers of resistance to infection.

Within the last ten years several attempts have been made to put this hypothesis to experimental test, and to ascertain whether derangement of metabolism, due to known defects in the diet, can be correlated with measurable changes in the defence mechanisms. The results of this work show that resistance to induced infection may be lowered on defective diets. So far, however, there is doubt whether deficiencies in the diet affect the antibody forming mechanisms in such a way as can be measured by our present methods.

The present position is thus as follows: it is generally believed that the nature of the diet is a factor in determining susceptibility to disease, and this has been confirmed in animals fed on deficient diets and subjected to incidental or experimentally induced infections. There is, however, as yet little definite information on the relative influence of different dietary constituents or factors in affecting susceptibility. Similarly, little is known regarding changes in the composition of the tissues or fluids of the body or of the normal metabolic processes accompanying lowered resistance. These questions are obviously of the utmost importance in both human and veterinary preventive medicine. Systematic research has little more than begun. There is likely to be in the immediate future a great increase in the volume of work on the many diverse problems being raised, and there is justification to expect that their solution will throw new light on the causation, prevention, and treatment of disease.

## Present Investigations.

At the Rowett Institute feeding experiments are carried out with groups of farm animals. It has been noted that the increased susceptibility to infections, especially of the respiratory tract, which seem to develop in small laboratory animals on defective diets, occurs also in larger animals under similar dietary conditions. Such information as could be obtained regarding the incidence of disease in farm animals, on different rationing systems, or on pastures of different composition, have suggested that a similar relationship exists under ordinary farming conditions.

In 1926 arrangements were made for carrying out some large scale observations on this subject on both human beings and animals under field conditions. These observations were accompanied by studies particularly with reference to experimental animals under controlled conditions on the influence of diet on the state of health, on the chemical composition of the blood, and on immunological reactions. The survey on human beings, as originally planned, has been completed. An account of it is to appear in one of the special reports of the Medical Research Council. Hence only a very brief reference to this part of the work is given here. The investigation on farm animals is being continued and developed, and as it progresses papers dealing with its different aspects will be published from time to time. The present preliminary communication is intended to give a general account of the investigation as a whole, with an indication of the nature of the results being obtained.

## Observations on Human Beings.

A survey was made of the nature of the diet and of the incidence of disease in two East African tribes with very different dietary habits. The diet of one of the tribes consisted chiefly of cereals. The calcium intake was low. The vitamin content of the diet was not determined, but it is probable that there may have been a deficiency of one or more of the vitamins. The diet of the other tribe, consisting largely of milk, meat, and raw blood, though defective in other respects, was rich in those nutrients which were deficient in the diet of the former tribe. Table I. shows the probable average daily intake of the most important food constituents in the diets of the two tribes. It will be noted that the diet of the women is somewhat different from that of the men, and, in the cereal-eating tribe, appreciably better.

TABLE I.

| — | Cereal-eating tribe. | | Meat-eating tribe. | |
|---|---|---|---|---|
| | Males. | Females. | Males. | Females. |
| | g. | g. | g. | g. |
| Protein .. .. | 99 | 140 | 300 | 165 |
| Fat .. .. | 22 | 20 | 160 | 90 |
| Carbohydrates .. | 390 | 400 | 100 | 245 |
| Ca .. .. | 0·28 | 0·46 | 2·94 | 2·03 |
| P .. .. | 3·0 | 4·4 | 4·36 | 3·19 |
| Na .. .. | 0·48 | 0·88 | 1·80 | 0·94 |

g. = grammes.

Samples of blood were obtained from members of the cereal-eating tribe, but owing to a tribal taboo it was impossible to get samples from the flesh-eating tribe on their natural diet. The average calcium content of the blood-serum in 90 natives was 9·4 mg. per 100 c.cm., as compared with 11·4 mg. in 13 Europeans living in the same district. It was found that the addition of calcium salts to the food resulted in a rise in average serum calcium from 9·2 to 10·0 mg. in the case of seven experimental subjects. There was thus evidence that a restricted calcium intake was correlated with a low calcium level in the blood-serum.

A survey of the incidence of disease taken in the native reserves showed that in the tribe with the cereal diet pulmonary conditions, bronchitis, and pneumonia accounted for 31 per cent. of all cases of sickness, tropical ulcers for 33 per cent., and phthisis for 6 per cent., compared with 4, 3, and 1 per cent. respectively in the tribe with the meat, milk, and raw blood diet. In this tribe the chief disease was rheumatoid arthritis, associated with chronic constipation.

The cereal-eating tribe suffered generally from heavy infestation with intestinal parasites. The diet of the women was, on the whole, less deficient than that of the men. It was therefore thought that, if defective diet favoured infestation, a difference might be found in the incidence of parasites as between men and women. An examination of the post-mortem records of 104 serial, unselected cases, showed that infestation was nearly twice as frequent in men as in women, and records of examinations of fæces at the Medical Laboratory showed 74 per cent. of men infected as against only 49 per cent. of women. It is recognised that these observations do not carry the same weight as the results of carefully controlled experiments, but they are in line with veterinary data collected elsewhere.

Owing to the death of the chief investigator in East Africa, the part of the investigation dealing with African natives has been suspended. This pioneer work has given results which warrant further inquiry. The poor physique, high incidence of disease, and the rather rigid nature of the diet in many of the African tribes make them a field of great potential value for the study of the subject.

### Investigation on Sheep.

It was decided to carry out the main part of the investigation on sheep. The chief disadvantage in using this animal is the difficulty and expense involved in testing susceptibility to disease by the direct experimental method of induced infection. On the other hand, this animal offers many concrete advantages for the purposes of a research of this nature. Its size and docility allow blood to be drawn rapidly and in large quantity. This is very necessary where a number of biochemical and serological tests are being performed concurrently on the same individual. Further, sheep of standard breed and age are easily obtained, expert practical management is available, and epizoötic diseases do not introduce serious complications as in laboratory animals. Sheep are available in sufficiently large numbers to render statistical data (such as mortality percentages) of value, and at the same time are sufficiently large to admit of correlation between the clinical condition of any particular individual, and the biochemical and serological properties of its blood. On any large scale experiment on sheep, the basal diet must of necessity be pasture. An extensive investigation on the chemical composition of pastures, carried out jointly by the Nutrition Institute at Cambridge and the Rowett Institute, has now been completed.

In using sheep, therefore, the present research becomes a natural sequel to that recently concluded, the focus of interest being merely shifted from natural pastures to the naturally grazing animal. Knowledge obtained is of direct application to an animal of economic importance.

#### FIELD OBSERVATIONS.

An attempt was made to collect information with regard to the mortality of sheep in districts with pasture of different nutritive value. It was found difficult to get reliable data. Such information as could be obtained showed that mortality was higher on poor hill grazings where the pastures had an abnormally low content of inorganic salts, especially calcium and probably, of course, with deficiencies in other respects. It was recognised that there are other factors affecting mortality besides the probable influence of the amount and composition of the food.

During the years 1926 to 1928 tests were done on various hill farms to ascertain whether the supplementary feeding of substances thought to be deficient in the pastures would be followed by improved nutrition and decreased mortality. Groups of sheep were given from ½ to 1 oz. per head per day of a mixture containing mineral salts, cod-liver oil, and a protein-rich foodstuff. These tests were complicated by the handling of the sheep for commercial purposes, and the data were largely statements by shepherds which could not be checked. Results seemed to indicate, however, that in areas where mortality was high, improved nutrition accompanied decrease in mortality following the supplementary feeding.

#### OBSERVATIONS UNDER CONTROLLED CONDITIONS.

By 1929 the results were considered sufficiently promising to warrant making provision for work under more exact conditions. A sheep farm, on which the nutritive value of the pasture was low and the mortality high, was taken over, along with the existing stock, so that the workers might have complete and continuous control of the animals.

*Clinical.*—Clinical observations, including weighings, chemical analyses of the blood for calcium and inorganic phosphorus and various other constituents, certain serological tests, and determinations of the cell and hæmoglobin content of the blood, were made concurrently at intervals throughout the year on sheep under natural conditions on the farm. Similar observations were also made on young sheep which had been removed from the farm to Aberdeen in the autumn, and grazed during the winter on pasture of better composition.

It was found that there was a remarkable progressive decrease in weight during the winter in the young sheep—i.e., those born in the previous spring. Table II. shows the changes in weight in young sheep on poor grazing, compared with those wintered on relatively good grazing.

TABLE II.

| Group. | — | Body-weight in lbs. | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct. 5th | Nov. 3rd | 29th | Dec. 25th | Jan. 30th | Feb. 13th | Mar. 3rd |
| A. | Hill pasture .. .. | 49 | 49 | 48 | 45 | 39 | 39 | 35 |
| B. | Cultivated pasture .. | 48 | 51 | 54 | 54 | 54 | 52 | 50 |

These figures refer to ewe hoggs. Group A were wintered at the experimental hill farm without supplementary feeding. Group B were wintered on arable ground at Aberdeen. Only pasture was fed.

As will be seen below, an interesting parallelism with these changes was observed in certain of the biochemical and serological properties of the blood.

*Biochemical.*—Chemical examination of the blood showed that in hill sheep on mineral deficient pasture the blood calcium reaches a maximum (11·8 mg.) in summer (July), shows a progressive fall throughout the winter months, to reach a minimum value of 8·2 mg. in the following spring (April).

The calcium content of the pasture showed a similar seasonal variation. The values found on analysis were 0·30 mg. calcium per cent. of dry matter in summer compared with 0·16 mg. in the winter months. This progressive fall in the level of the blood calcium accompanying a progressive reduction of body-weight in animals under ordinary farming conditions is a finding of both scientific interest and economic importance. Experiments at present in progress suggest that both under-nutrition due to lack of food, and malnutrition due to deficiencies of special dietary factors, are involved.

Workers in South Africa have found that in cattle grazing on phosphorus-deficient veldt the inorganic blood phosphorus may be less than 50 per cent. of the normal value. It is obvious that the calcium and inorganic phosphorus content of the blood is not so constant as has been supposed, but that it is directly affected by, and is to some extent a reflection of, the nature of the diet.

*Serological.*—In this study is was decided, as a first step, to carry out systematic observations on the natural immunity reactions of the blood-serum. The natural lytic, agglutinating, and complement-fixing antibodies of various animals for bacteria were made the subject of detailed inquiry in the Bacteriology

Department of Edinburgh University, and certain serum reactions dependent on these principles were selected in virtue of their known occurrence in measurable degree with sheep serum. The tests were strictly quantitative.

The reactions selected were as follows: (1) hæmolytic action of serum towards rabbit's erythrocytes, which depends on a natural lytic antibody acting along with serum-complement; (2) bacteriolytic effects of serum towards (*a*) *Bacillus coli* (a typical strain), (*b*) *Bacillus suipestifer*, which also depends on natural antibodies acting along with complement; (3) agglutinating effects of serum towards (*a*) *B. abortus* (Hg), (*b*) *B. paratyphosus* B, which are due to natural agglutinating antibodies acting independently of complement. Owing to an initial difficulty in obtaining a suitable hæmolytic system for testing sheep's complement independently of any natural hæmolytic antibody present in the serum, the preliminary observations do not include a direct measure of complement activity.

The serological tests on the hill sheep referred to above elicited most interesting results. In the month of May when, according to clinical observations, the state of nutrition was at its worst, and the calcium level of the blood at its lowest, all the serum reactions were markedly weaker than in sheep of the same breed, age, and sex grazing on a cultivated pasture at Aberdeen. Further, the seasonal changes (from May, 1930, to March, 1931) in certain serum reactions—e.g., hæmolysis—ran parallel to those in body-weight and blood-calcium, and in animals transferred in October from the hill farm to Aberdeen these reactions showed an augmentation in value corresponding to the increase in body-weight and blood-calcium. In view of our limited knowledge of the significance of these reactions, and also of the probable intercurrence of uncontrolled factors other than nutritional which affect them, these findings which are stated here in general terms must be interpreted with the greatest caution. The results indicate, however, that the natural immunity reactions of blood-serum may be markedly influenced by nutritional factors which also affect the chemical composition of the blood.

*Hæmocytological*—These tests showed great differences among individuals under similar dietary and other environmental conditions, and this must be allowed for in evaluating the data. The figures in Table III. show the averages of 40 sheep taken at random in spring when the condition of the animals was worst, and in summer when the condition was improved.

TABLE III.

| — | Mean red cell content per $mm.^3 \times 10^6$ | Mean white cell content per $mm.^3 \times 10^3$ | Mean percentage of hæmoglobin. | Mean percentage volume of packed cells. |
|---|---|---|---|---|
| May, 1930 | 7·39±2·02 | 7·19 | 64±11·95 | 25·7±6·2 |
| July ,, | 10·23±1·96 | 8·47 | 92±11·81 | 30·8±6·3 |

So far as the results can be considered as significant, they show that anæmia is one of the features of the malnutrition noted in spring. The study of sheep throughout the year on grazings recognised to be of low nutritional value shows a parallel seasonal variation in the chemical composition of the pasture, the general clinical condition of the animals, and certain constituents and properties of their blood. As yet, however, the data are insufficient to allow definite conclusions to be drawn.

### INFLUENCE OF DIFFERENT DIETARY FACTORS UNDER EXPERIMENTAL CONDITIONS.

The pasture on the experimental farm to which the above observations refer is relatively poor in protein and in inorganic constituents, especially calcium. An experiment was done on sheep kept in confinement to ascertain the influence of the addition of calcium, cod-liver oil, and protein, both singly and in combination, when added to a basal diet roughly corresponding to hill pasture in chemical composition.

Eighty castrated male sheep were used, which were about seven months old—i.e., about half grown—at the beginning of the experiment. They were taken from the Institute stock, and had a uniform pre-experimental nutritional history. They were divided into 16 groups of five each, eight groups being kept indoors and the other half in outdoor pens.

At intervals of about a month clinical notes were made; samples of blood were analysed for calcium, inorganic phosphorus, non-protein nitrogen, urea nitrogen, and at longer intervals for fibrinogen, albumin, globulin, cholesterol, and cystine. Serological tests and blood counts were also carried out as described above. The results briefly were as follows.

#### CLINICAL.

The animals in the indoor basal group after about four months stopped growing and became weak and emaciated. The addition of protein (in the form of cotton-seed meal) apparently led to a prolongation of the growth period, but later signs of bone deformity and debility appeared and growth stopped.

The addition to the basal diet of either calcium or cod-liver oil prevented these results. Growth was most rapid in the groups receiving cod-liver oil. No such clinical differences were obvious in the outdoor groups until a much later date, and even then they never became so pronounced as in the indoor sheep.

In July the animals in basal and basal-plus protein groups indoors were so debilitated that the experiment had to be terminated. These groups, together with all poorly conditioned sheep from other groups, were then transferred to good grazing. This was followed by a remarkably rapid improvement in their condition.

#### BIOCHEMICAL.

The only biochemical data considered here are those referring to the calcium and inorganic phosphorus of the blood.

The pre-experimental average figures were calcium 11·45 mg. and inorganic phosphorus 5·11 mg. Table IV. illustrates the marked extent to which

TABLE IV.—*Blood-calcium and Inorganic Phosphorus.*

mg. per 100 c.cm.

| | Calcium. | Phosphorus. |
|---|---|---|
| Basal | 7·06 | 10·53 |
| ,, + protein | 6·46 | 11·32 |
| ,, + calcium | 9·90 | 6·84 |
| ,, + C.L.O. | 10·06 | 7·29 |
| ,, + protein + calcium | 8·80 | 7·88 |
| ,, + protein + C.L.O. | 9·35 | 7·78 |
| ,, + calcium + C.L.O. | 9·66 | 6·72 |
| ,, + protein + calcium + C.L.O. | 9·54 | 6·93 |

blood-calcium and phosphorus may be influenced by dietary factors. The figures refer to the outdoor groups in March, when no clinical differences were as yet appreciable.

The figures show that there was a marked fall in the calcium in the basal group, accompanied by a marked rise in inorganic phosphorus. The addition of either calcium or cod-liver oil tended to maintain the normal levels of calcium and phosphorus in the blood.

In the indoor groups the general trend of the figures was similar as regards calcium, but the reciprocal rise in phosphorus was not observed.

Table V. illustrates the regulatory effect of cod-liver oil or lime in maintaining normal blood-calcium and phosphorus levels in the outdoor groups.

TABLE V.

mg. per 100 c.cm. blood.

| — | Calcium. | | Inorganic phosphorus. | |
|---|---|---|---|---|
| | January. | March. | January. | March. |
| All animals from basal or basal + protein groups .. .. | 10·4 | 6·7 | 5·5 | 10·9 |
| Animals from other groups receiving either calcium or C.L.O. or both .. .. .. | 10·9 | 9·5 | 5·3 | 6·9 |

SEROLOGICAL.

In this preliminary communication only those data which seem of most interest need be referred to. Individual animals, as might be expected, showed quantitative variation in their reactions, and the values for the animals in each group were therefore averaged. The number of animals in a group was small, and any differences, unless pronounced, were not regarded as significant. It is noteworthy, nevertheless, that these averages in the pre-experimental stage were on the whole remarkably uniform.

During the course of the experiment significant variations in the average values for certain of the reactions were observed. These were related to: (1) the time of the year, (2) environment—according to whether the animals were kept indoors or outdoors, (3) the nutritional groups, (4) transfer to grass towards the end of the experiment.

*Seasonal Variations.*—To estimate this the average values of all the animals were taken. The bacteriolytic effect towards *B. coli* rose to a maximum in March, and fell progressively in May and September. A similar curve was noted in the hæmolytic reaction and in the agglutination of *B. abortus*. In the case of *B. paratyphosus* B agglutination the seasonal curve was different: rising to a maximum in January, and then falling progressively in March and May, but rising again to a second maximum in September. Such seasonal fluctuations are of great interest from a physiological standpoint, and require a good deal of detailed investigation before any interpretation can be placed on them. It is obvious that they introduce a factor which must be allowed for in any study of serum reactions in relation to nutrition. It should be noted also that these seasonal changes do not show any parallelism with the general condition of the animals or the results of chemical examination of the blood, though such seasonal parallelism was observed among animals on the hill pasture.

*Environment.*—A marked difference was elicited between the indoor and outdoor animals in their bacteriolytic reactions towards *B. coli*. In January the average for the indoor animals was about twice that of the outdoor groups; this difference became greatly accentuated in March. In May and September, the divergence was less. A somewhat similar, although less marked, difference in March was noted as regards the hæmolytic reaction. On the other hand, in the agglutination of *B. abortus* the outdoor animals showed a higher average value throughout.

*Nutritional Groups.*—In certain reactions distinct group differences were noticeable at particular periods; in other cases differences were insignificant.

Bacteriolytic Action towards *B. coli*. Groups 4 and 8—i.e., animals receiving added calcium and cod-liver oil in their rations—exhibited the highest averages in the early part of the year; after this there were no significant differences.

Hæmolysis. In January and March, Group 8 showed the highest values. Among the outdoor animals, in January the average values of the groups deficient in protein (1 to 4) were noticeably higher than those receiving protein in their rations (5 to 8). In March, however, the position was reversed: the values for Groups 6 to 8, and especially 8, had risen, whereas in Groups 1 to 4 there was a conspicuous fall.

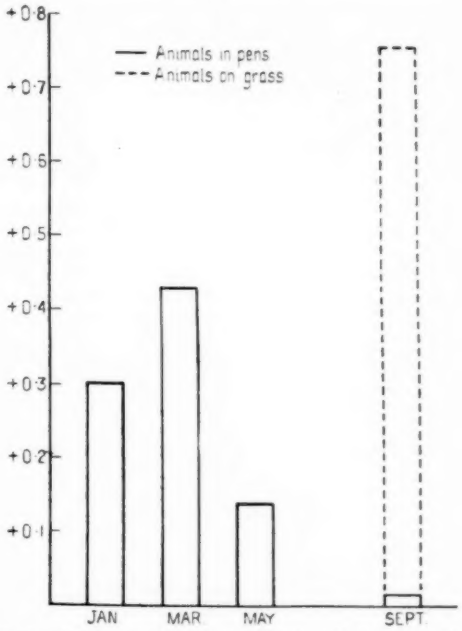


Chart showing comparative bacteriolytic activity of the blood-serum of sheep in pens and on grass.

Agglutination of *B. abortus*. The differences in September among the outdoor groups were striking, Group 1 (the animals in worst general condition) being highest, Group 8 (the best conditioned) lowest; Group 4 was the lowest of the protein-deficient animals (1 to 4), Group 1 the highest; Group 8 was the lowest of the animals receiving additional protein (5 to 8), Group 5 the highest. Taken together, the protein-deficient animals gave much higher average values than those receiving additional protein. This was practically the reverse of the hæmolytic results in March.

*Transfer to Grass.*—A comparison was made of the reactions in sheep transferred to grass towards the end of the experiment with those in animals kept in pens and rationed as previously. The average values for all animals in these two categories respectively were calculated, and remarkable differences were elicited.

Among the animals on grass a great increase was observed in the bacteriolytic activity towards *B. coli*, amounting to 29 times that of the animals on rations in pens (see Figure). An analogous result was obtained with another strain of *B. coli*. A similar difference,

but of less degree, was noted with *B. suipestifer*. In hæmolytic power also the animals on grass exhibited a higher average than the others. By contrast, the influence on the agglutination reaction of transfer to grass was the reverse of that on the lytic reactions.

These serological observations must be regarded as merely a preliminary survey of the subject studied. They reveal its complexity, and many of the data are at present difficult to interpret. Nevertheless the work has clearly demonstrated that the natural immunity reactions of the serum (and the principles on which they depend) are subject to certain influences that may affect animals in nature. Thus, seasonal variation is well marked. In animals on natural pasture a nutritional factor might, of course, determine such variation, but this is excluded in the experiment under discussion. The question arises whether the changes are related to certain of the cyclical physiological processes of these animals. The problem is complicated, however, by the different seasonal curves of the various reactions, though in most cases the occurrence of a maximum in March has been a pronounced feature. The reactions are also influenced by environmental conditions, such as the indoor or outdoor life. Certain of the group differences elicited may reasonably be accepted as valid, and the work as a whole has shown that nutritional factors undoubtedly influence the natural immunity reactions of the serum. The various reactions were not influenced in an identical manner; certain appeared to be, as it were, more sensitive than others to nutritional factors. As regards the lytic reactions, Groups 4 and 8 showed the highest values during the earlier stages of the experiment, and this is specially significant when correlated with the data recorded in the previous sections of the paper. The influence of protein deficiency and the addition of protein to the ration has also been demonstrated. As stated above, no direct measure of complement activity has been made, and it is an open question whether these differences in the lytic reactions are due to variation in complement or natural antibodies. As regards the agglutination reactions, certain of the results seem to indicate that the values may be inversely proportional to the physical and nutritional state of the animals. The effects of transfer to grass were most striking, and the results in the lytic reactions could be correlated directly with the general condition of the animals and the calcium content of the blood; on the other hand, the values for the agglutination reactions showed an inverse relationship.

### Conclusion.

The observations recorded in this communication form an interesting and significant contribution to the study of nutrition in relation to blood chemistry and immunity.

Differences in diet have been correlated with changes in particular constituents of the blood, and with certain immunological principles of the serum.

The influence of variation in the calcium content of the diet on the general health of the animal, on the calcium and phosphorus content of its blood, and on certain of its natural serum reactions afford an important illustration of the correlations observed in the course of the work.

Whilst it must be admitted that many of the data elicited by the investigation are difficult to interpret in the present state of knowledge, they clearly point to the urgent need for extended and detailed studies in this important field of biological investigation.

## ACTINOTHERAPY AT A TUBERCULOSIS DISPENSARY.*

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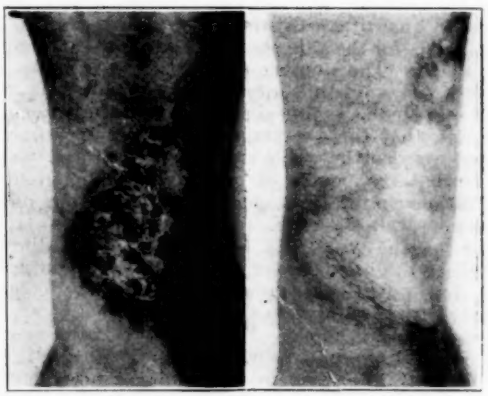
It is over 30 years since Sequeira [1] began to use the Finsen lamp for the treatment of lupus at the London Hospital. Local treatment with this lamp, and subsequently with the Finsen-Reyn and Kromayer lamps, was supplemented in 1922 by general carbon-arc baths, thereby raising the percentage of cures from 70 per cent. to 90 per cent. It is, however, obvious that for small clinics—e.g., a tuberculosis dispensary—less expensive equipment is essential.

At the Eccles Dispensary, with which this paper deals, the equipment consists of the following lamps: two 30-ampère long-flame carbon arcs ("Sunrae"), one Jesionek mercury-vapour, one Kromayer mercury-vapour, and one Murray-Levick infra-red. It has been the aim of the writer to adapt the methods so successfully used by Sequeira and O'Donovan [2] to the requirements of dispensary practice in a county area. These are (1) the cure of the patient; (2) the safety of the patient—i.e., the avoidance of over-dosage or the "lighting up" of dormant lesions in the lungs or elsewhere; (3) the possibility of treatment being carried out by a trained nurse acting under regular but not prolonged medical supervision.

FIG. 2.

A B



(A) Lupus over forearm in a girl aged 18. Duration of disease before light treatment commenced, 12 years. She previously had treatment by ointment as an out-patient, and as an in-patient at a special hospital, but then occurred a break of three years when no treatment was received, owing to refusal of parents, until patient accepted artificial light treatment at dispensary.
(B) Same patient after two months' treatment with carbon-arc and local treatment (plaster and Kromayer lamp). Still under treatment. Pigmentation: deep. Weight stationary.

### Methods of Application.

The methods used at Eccles are as follows:—

*General treatment.*—The patients are treated in separate groups (men, women, boys, girls), and attend thrice weekly. There is in addition one evening session a week for men at work in the daytime. Separate cubicles are provided for use as dressing-rooms, and suitable loin-slips and eyeshades are

* A paper read before the North-Western Tuberculosis Society at Eccles.

supplied at a nominal charge. The urine of each patient is tested before the course is commenced, and the temperature at each visit previous to undressing. Weights are recorded weekly.

The treatment-room has through and side ventilation, together with an electric fan, thus ensuring a constant circulation of air. Siemen's "snow-white" carbons have been used, as they were found to be cleaner and to give off less fumes than others tried. The initial dose, of 15 minutes back and front at three feet distance, is increased at weekly intervals by half an hour to a maximum of two and a half hours. This method is to be preferred to the shorter exposure of patients to more powerful cored carbons. The saving in time is counterbalanced by the risk of "lighting up" dormant lesions, and the very close medical supervision that is necessary. In attempting to combat a condition of extreme chronicity a rapid and transient stimulation appears unsuitable. Moreover, Leonard Hill and Eidinow [3] have shown, by exposing shaved rabbits to a "Beam" gas fire, which is rich in short infra-red rays, that their resistance to a general staphylococcal infection is increased. It would thus appear that the red and infra-red (heat) rays are of importance.

As the method of minimal stimuli gradually increased is perfectly safe, preliminary skin tests have not been found necessary. The majority of patients pigment well and profess a feeling of well-being. The carbon-arc lamps have been used for as many cases as possible, but general exposure to the Jesionek mercury-vapour lamp has sometimes been used. With this lamp, exposures at three feet distance are at first one minute back and front, increasing by two minutes weekly to a maximum exposure of 20 minutes. The results have not been found so satisfactory as with the carbon-arc lamps.

### LUPUS.

As Reyn [4] has pointed out, lupus can be improved by light baths alone, but a real cure will not occur without the application of concentrated light. This has been obtained by the use of the water-cooled mercury-vapour (Kromayer) lamp with exposures long enough to obtain a blister (5–20 minutes), care being taken, by pressure of the lens, to render the part as bloodless as possible.

FIG. 1.

A B

(A) Lupus of 33 years' duration in a woman aged 40. Previously treated with Finsen light at a skin hospital for five years and "snow." No treatment for last 19 years.
(B) Same patient after 14 months' treatment with general carbon-arc and local mercury-vapour Kromayer lamps. Pigmentation: deep. Weight: lost ½ lb.

In the treatment of extensive thick or warty lupus, especially on the trunk or limbs, a preliminary energetic treatment with creosote and salicylic acid plaster has proved very useful, as has "spiking" of isolated nodules with acid nitrate of mercury. A number of long-standing cases of widespread lupus have been treated at Eccles; many of them have had previous X ray treatment elsewhere. These cases have often proved intractable and tedious, with a tendency towards malignancy. They require more care and watchfulness than those not previously treated.

### TUBERCULOUS ADENITIS.

Apart from lupus and scrofulous conditions of the skin, the next largest group treated has been tuberculous glands with softening, and frequently skin involvement. In these cases local treatment of the glandular condition is essential, by aspiration if possible, or by incision when the skin cannot be saved. The results in these cases have usually been good. More intractable is adenitis without softening. Local treatment with the Jesionek lamp in addition to general exposure to carbon-arc or mercury-vapour lamps has been found useful. It results in either (*a*) softening, when the local exposure should cease and aspiration be done; or (*b*) hardening and shrinking of the glands. The end-result is frequently the presence of small hard glands, which are apparently quiescent.

FIG. 3.

A B

(A) Enlarged glands and scrofuloderma in a woman aged 26. Duration of disease before light treatment commenced, 19 years. Previous treatment: several operations.
(B) Condition after five months' treatment with carbon-arc and Jesionek (general) lamps. Pigmentation: deep. Weight: gained 10¾ lb.

### OTHER TUBERCULOUS CONDITIONS.

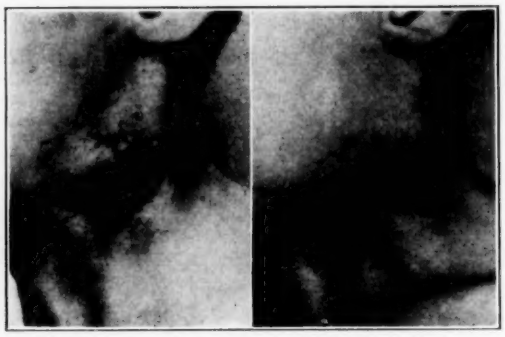
Other conditions—e.g., tuberculosis of bones, joints, and abdomen—will be referred to later. No cases of pulmonary tuberculosis have been treated.

It must be emphasised that light treatment has been used as a caustic

or a stimulus, and has been combined with other forms of treatment—e.g., local caustics, aspiration and incision of superficial abscesses, and division of keloid bands. Attention to the general hygiene

FIG. 4.

A B



(A) Cervical adenitis with sinus in a boy aged 9. Duration of disease before light treatment commenced: four years. Previous treatment: operations.
(B) Condition after three months' treatment with carbon-arc and Jesionek (local) lamps. Pigmentation: medium. Weight: gained 3 lb.

of the patient must not be overlooked; in some cases of under-nourishment milk has been provided with apparent benefit.

## Results.

The present paper deals with the three years 1928–30, during which period 273 cases have been treated (Table I.).

TABLE I.

| — | Adults. | Children. | Total. |
|---|---|---|---|
| Lupus and scrofulous skin conditions | 75 | 31 | 106 |
| Adenitis with softening | 45 | 48 | 93 |
| Adenitis without softening | 15 | 21 | 36 |
| Bones and joints | 21 | 3 | 24 |
| Abdomen | 3 | 5 | 8 |
| Others | 4 | 2 | 6 |
| Total | 163 | 110 | 273 |

Of this number 63 ceased treatment for one or other of the following reasons: (*a*) admitted to a residential institution, (*b*) removal from district, (*c*) unwilling or unable to continue treatment on account of work or domestic circumstances. The

TABLE II.

Av. = Average duration of treatment in months.
A. = Adults. C. = Children.

| — | | Quiescent. | | Improved. | | Stationary. | |
|---|---|---|---|---|---|---|---|
| | | No. | Av. | No. | Av. | No. | Av. |
| Lupus and scrofuloderma | A. | 35 | 12 | 3 | 10 | — | — |
| | C. | 21 | 7½ | — | — | — | — |
| Adenitis with softening | A. | 29 | 6½ | — | — | — | — |
| | C. | 35 | 6 | — | — | — | — |
| Adenitis without softening | A. | 4 | 8 | — | — | — | — |
| | C. | 11 | 6½ | — | — | — | — |
| Bones and joints | A. | 8 | 6½ | — | — | 2 | 8 |
| | C. | 1 | 8½ | — | — | — | — |
| Abdomen | A. | 3 | 4½ | — | — | — | — |
| | C. | 3 | 6 | — | — | — | — |
| Others | A. | 2 | 5½ | — | — | — | — |
| | C. | — | — | — | — | — | — |
| Totals | A. | 81 | — | 3 | — | 2 | — |
| | C. | 71 | — | — | — | — | — |
| | | 152 | | 3 | | 2 | |

63 consisted of 45 adults and 18 children, and may be subdivided as follows: lupus, 21; adenitis with softening, 19; adenitis without softening, 11; bones and joints, 8; abdomen, 1; others, 3. At the end

TABLE III.—*Pigmentation.*

| — | | Deep. | Medium. | Slight. | None. |
|---|---|---|---|---|---|
| Lupus and scrofuloderma | A. | 23 | 9 | — | 3 |
| | C. | 14 | 4 | 1 | 2 |
| Adenitis with softening | A. | 19 | 9 | 1 | — |
| | C. | 19 | 15 | 1 | — |
| Adenitis without softening | A. | 2 | 2 | — | — |
| | C. | 5 | 5 | 1 | — |
| Bones and joints | A. | 5 | 2 | 1 | — |
| | C. | — | 1 | — | — |
| Abdomen | A. | 1 | 2 | — | — |
| | C. | 1 | 1 | 1 | — |
| Others | A. | 1 | 1 | — | — |
| | C. | — | — | — | — |
| Totals | | 90 | 51 | 6 | 5 |

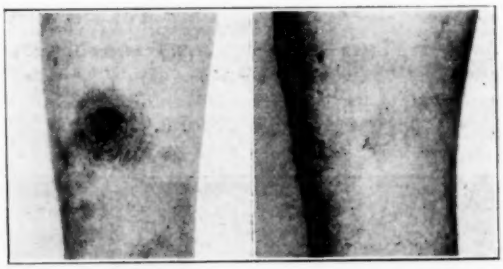
TABLE IV.—*Weights.*

| — | | Gained. | Lost. | No change. |
|---|---|---|---|---|
| Lupus and scrofuloderma | A. | 20 | 14 | 1 |
| | C. | 20 | 1 | — |
| Adenitis with softening | A. | 19 | 9 | 1 |
| | C. | 31 | 2 | 2 |
| Adenitis without softening | A. | 2 | 2 | — |
| | C. | 9 | — | 2 |
| Bones and joints | A. | 6 | 2 | — |
| | C. | 1 | — | — |
| Abdomen | A. | 1 | 1 | — |
| | C. | 2 | 1 | 1 |
| Others | A. | 1 | 1 | — |
| | C. | — | — | — |
| Totals | | 112 | 33 | 7 |

of 1930, 152 patients had been discharged as quiescent, leaving 53 still under treatment. Particulars of the patients discharged, together with the average duration of treatment, are shown in Table II. The average duration of all the 152 cases was seven and three-

FIG. 5.

A B



(A) Bazin's disease, of three to four years' duration, in a woman aged 21. Previous treatment: attended a skin hospital for ointment and medicine.
(B) Condition after four months' treatment with carbon-arc and eusol dressing. Pigmentation: deep. Weight: gained 4½ lb.

quarter months. The results are adversely affected by the existence of many cases of extensive lupus of long standing. Thus, four adult lupus cases have attended for over two years, and one of them has only made 70 attendances.

Table III. shows the degree of pigmentation of the 152 cases discharged as quiescent.

Thus in 90 the pigmentation was deep and in 51 medium, and improvement appears to be definitely associated with a good degree of pigmentation. As

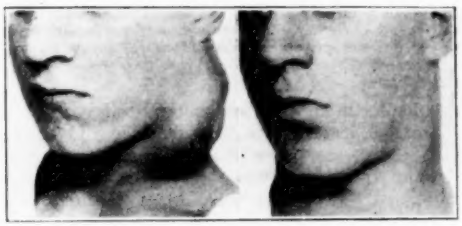
the ultra-violet rays cannot penetrate pigmented skin, early deep pigmentation is undesirable. With very deep pigmentation the carbon-arc baths have sometimes been temporarily suspended or replaced by exposure to the Jesionek lamp, local treatment being continued. The five cases without pigmentation received local treatment only.

WEIGHT OF QUIESCENT CASES.

Of 152 quiescent cases, 112 gained weight, 33 lost weight, and in 7 no change occurred (Table IV.).

FIG. 6.

A B



(A) Adenitis in a boy aged 16. Disease began ten years previously. Previous treatment: two operations at a general hospital eight years ago.
(B) Condition after four months' treatment with general carbon-arc and local mercury-vapour Jesionek lamps. Also aspiration. Pigmentation: deep. Weight: gained 14½ lb.

The appearance of typical cases before and after treatment is shown in the accompanying plates, and essential particulars are given in the corresponding legends.

RELAPSES.

All patients since discharge have been inspected at regular intervals; 23 patients have shown some degree of relapse, and further treatment has been given. These cases were as follows: lupus, 16; adenitis with skin involvement, 4; adenitis without skin involvement, 3.

## Finance.

Lissant Cox [5] has dealt fully with the financial aspect of light treatment at dispensaries, and has shown that a considerable saving has been effected as a result of not sending patients to residential institutions and out-patient departments of hospitals. The cost, which includes carbons and current as well as all standing charges—e.g., proportion of time of medical and nursing staff, rent and rates, fuel, light, cleaning, repairs, renewals, and depreciation—naturally varies with the number of patients treated. At Eccles the numbers under treatment at the end of 1928, 1929, and 1930 were 73, 60, and 53 respectively. In 1929 the total cost per patient per week was 4*s.* 6*d.*, which is about the same as the average for the administrative county of Lancaster (403 patients under treatment at 12 centres at the end of 1929).

## Conclusions.

1. Artificial light treatment can be successfully given at tuberculosis dispensaries under the control of local authorities.

2. It is especially useful in cases of lupus and allied skin conditions, adenitis with and without softening, and other superficial conditions.

3. It is much less effective in the treatment of tuberculous disease of the larger joints and bones, which should be sent to special residential institutions.

4. In the treatment of lupus a combination of general light therapy with local treatment—e.g., Kromayer lamp—is usually necessary, and the carbon-arc bath is to be preferred to the mercury-vapour lamp for general irradiation.

5. Prolonged exposure to weak carbons is preferable to brief exposure to strong-cored carbons. It is efficacious, safe, and particularly suitable for use by tuberculosis officers who have other duties to perform outside their dispensaries.

6. To obtain the best results, actinotherapy needs frequently to be combined with various forms of local treatment—e.g., the use of suitable caustics in lupus, and the aspiration or incision of abscesses. Painstaking attention to detail on the part of the doctor and nurse, and the regular attendance of the patient, are essential for success.

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# PORENCEPHALY.

A BRIEF REVIEW, WITH DESCRIPTION OF A CASE.

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TRUE porencephaly is a rare condition and will always be of interest, partly owing to the striking disproportion between the great anatomical defect in the brain and the mild degree of physical symptoms, partly on account of the controversy over its ætiology.

Heschl, who in 1859 first described this condition under its present name, assumed that the loss of brain substance was due to faulty development, analogous to other congenital malformations. Later he changed his view in favour of circulatory disturbances. Kundrat, in 1882, studied 12 cases and came to the conclusion that most of the porencephalic defects were congenital and due to vascular disturbances, hydrocephalus, anæmia, or psychic disturbance in the mother during pregnancy. He extended the use of the term to include any cerebral defect roofed over by the arachnoid. Schultze was the first to suggest that porencephaly might be due to infectious encephalitis and based his view on microscopic evidence of inflammatory changes. The existence of prenatal encephalitis was proved possible by Virchow and this ætiological theory has been supported by Strümpell, Limbeck, and recently by Globus. The histological investigations of the latter in a typical case afforded evidence of a meningo-encephalitis which led to strangulation of the blood-vessels producing anæmic necrosis, glial proliferation, and finally sclerosis and cavity formation. Very recently, Jaffé has emphasised the importance of trauma, which may occur in utero, during birth, in infancy, or in later life. He holds trauma at birth to be the commonest cause, citing the frequency of prematurity, prolonged labour, and instrumental delivery in the history of these cases, and suggests that, in addition to the direct action of the trauma on the brain, circulatory disturbances in the large veins from a damming-back of the blood in the sinuses are of great importance. In refuting the inflammatory theory he argues that inflammation may well be

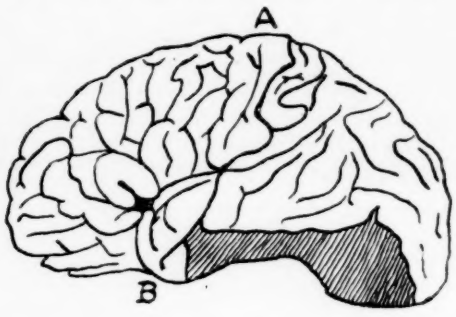
superimposed on a brain with an existing porencephalic defect, the latter acting as a locus minoris resistentiæ.

The following is an illustrative case of the traumatic group.

A female, aged 32, was admitted to Derby Mental Hospital in March, 1929, as a case of imbecility with epilepsy.

*History.*—Since infancy she had suffered from occasional epileptiform convulsions. In August, 1927, she had a serious fit and was comatose for two days. Her fits were not frequent, numbering about three or four a year. She had always had slight difficulty in walking, and had also suffered from a squint since infancy. Mental backwardness showed itself early, and at the age of 14 she had only reached Standard IV. She had never been able to earn her own living and was subject to frequent attacks of headache.

Her birth was abnormal. A fortnight before term her mother had a bad fall which brought about a premature




labour; this was prolonged, but not instrumental. The patient was the twelfth child. No obvious abnormality was discovered after the birth. The fits began about a year later.

On admission she was an under-developed, but well-nourished female. No stigmata of degeneration were present, but there was a mild degree of right-sided pes cavus. In the heart, lungs, and alimentary system no abnormality was detected. The urine contained no albumin or sugar. The Kahn reaction of the blood was negative.

The pupils were equal and regular in outline and reacted to light and accommodation. There was right external strabismus. Marked nystagmus was present, most noticeable when the patient looked to the left. The sight of the right eye was greatly impaired, though probably the condition was a right-sided homonymous hemianopia as, owing to her mental state, very little coöperation could be obtained from her. The tendon reflexes were abnormally brisk in the right lower limb, which was slightly spastic and showed a certain loss of coördination. The right upper limb was normal in all respects except for a rather weakened grip. A Babinski sign was obtainable on the right side at times. No anæsthesia could be detected.

The patient was hesitating and slurring in speech, dull and retarded in thought, and had little educated intelligence. Her memory was impaired and she was unable to do the simplest calculations. She could give no connected account of herself and was childish in her ways.

During her stay in hospital she had only one fit, which was of an epileptiform nature. She was able to get about the ward and did some useful light work. In December, 1929, she developed pulmonary tuberculosis, and she died in June, 1930.

*Autopsy findings.*—The calvarium showed increased thickness in its left posterior quadrant. The meninges and vessels appeared normal. The brain weighed 32¼ oz. The right hemisphere appeared normal and weighed 16 oz. The left hemisphere was the seat of a large porencephalic cyst in its posterior half and weighed only 10 oz.

In the diagram the porencephalic area is represented as situated to the right of the line A–B, and the shaded area represents the porus covered with membrane.

The cavity was found to be in direct continuity with the lateral ventricle and to contain cerebro-spinal fluid. It measured 8½ cm. × 6½ cm. × 3½ cm. and extended from the occipital pole almost to the apex of the temporal lobe, undermining the central white matter beneath the Rolandic area. The lining of the cavity was smooth. The unaffected cortex at the edges gradually thinned out to form the cyst wall. This thinned cortex had lost its normal configuration, and no definite gyri or sulci could be identified. It had a uniform thickness of 2–3 mm. except on the medial surface, where it measured 11–12 mm. with the configuration retained. Inferiorly the thinned cortex merged into the membrane roofing over the gap. This membrane consisted of two layers, the outer layer being continuous with the pia-arachnoid, the inner with the lining of the cyst and the lateral ventricle. A curious feature presented itself: an offshoot of the choroid plexus was attached to the inner surface of the membrane and formed a conspicuous band of choroid tissue stretching across the cavity.

On section the corpus callosum was found to be greatly thinned, especially in its posterior half. The internal capsule, too, was much wasted, though the basal ganglia appeared normal, and in the medulla a marked diminution in the size of the pyramid was evident on the left side.

Microscopic section of the pre- and post-central gyri showed paucity in the number of pyramidal cells and disturbance of lamination, with exaggerated gliosis, especially towards the surface. No trace of any inflammatory exudate or perivascular round-celled infiltration could be seen. The thinned cortical cyst wall consisted of a dense network of neuroglia and degenerated nerve fibres with total absence of nerve cells. The membrane consisted of an outer layer of pia-arachnoid carrying blood-vessels and an inner composed of flat or low cubical epithelium, identical in structure with ependyma; interposed between the two were strands of neuroglia fibres.

Porencephaly may be suspected, but cannot often be diagnosed during life for, as Tredgold says, the hemiplegia in some cases of pronounced porencephaly discovered post mortem is often astonishingly insignificant. This can only be explained by the faculty of the contra-lateral hemisphere to undergo relative compensatory hypertrophy and thus to assume functions of the atrophied half. Diagnostically, besides the history, the only suggestive features are the occurrence in a mental defective of epileptiform convulsions, headache, hemiplegia, and a flattening of one side of the skull. The latter sign, however, is frequently absent, as in the case related above. Here the history of a difficult premature labour following an injury to the mother again illustrates the importance of trauma at birth in the ætiology of this rare condition.

I am indebted to Dr. J. Bain, medical superintendent, for permission to publish this case.

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## PROLONGED ADMINISTRATION OF ARTIFICIAL RESPIRATION.

By Philip Drinker, S.B., Ch.E.,

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In a series of papers published elsewhere there have been presented physiological[1] and clinical[2] data obtained by the use of a mechanically operated device for administering artificial respiration over long periods.

The device used is known as a respirator and consists of a sheet metal tank equipped with a comfortable bed and mattress (Fig. 1). The patient's head protrudes through a flat soft rubber diaphragm or collar attached to the body of the respirator, the rubber collar making an air-tight seal about the patient's neck. The diameter of the collar is adjustable, and thus excessive tension on the neck of the patient is avoided.

By means of electrically driven blowers and an appropriate valve arrangement, the air pressure within the tank is changed alternately from a few centimetre

of water negative pressure to normal atmospheric pressure. The negative pressure induces inspiration—the chest and diaphragm of the patient expand and air is inhaled. The return to atmospheric pressure allows the recoil of the thorax and the respiratory muscles, together with the elasticity of the lungs, to cause expiration. Both the depth and the rate of breathing are under the control of the attendant and can be measured (or recorded) by means of a suitable U-tube manometer, filled with coloured water and connected by rubber tubing to the body of the respirator.

In general, a negative pressure of about 12 to 18 cm. of water suffices to maintain adequate ventilation in an adult or child with complete respiratory paralysis. In the case of newborn babies in which respiration does not begin within a few minutes after birth, smaller negative pressures (from 8 to 10 cm.) have been found adequate.[3] Our experience indicates that the negative pressure used should just be sufficient to prevent cyanosis or obvious respiratory distress; nothing is gained by using excessive negative pressures for long periods, while we have reason to believe that such pressures actually do harm to the lung tissue, particularly in the case of infants whose lungs may be atelectatic.[4]

Without having the pump stopped, the patients can eat, drink, and sleep while in the respirator. A bedpan can be passed through one of the portholes, enemas can be given, and rectal drips can be administered in deglutition cases. The noise of the machinery, although not excessive, is sufficient to prevent the use of a stethoscope in chest and heart examinations. We have taken rontgenograms of patients' chests both while the respirator was running and when the bed was pulled out and the pump stopped.

Of possible interest to physiologists is the fact that such slight negative pressures—equivalent to 12 to 18 cm. of water—are sufficient to induce inspiration in a person whose respiration has ceased, and that it has been found unnecessary to use positive pressures inside the respirator. In the case of an animal deeply anæsthetised or curarised still smaller negative pressures suffice. The method offers the advantage, over intratracheal insufflation, that it imitates normal breathing fairly accurately.

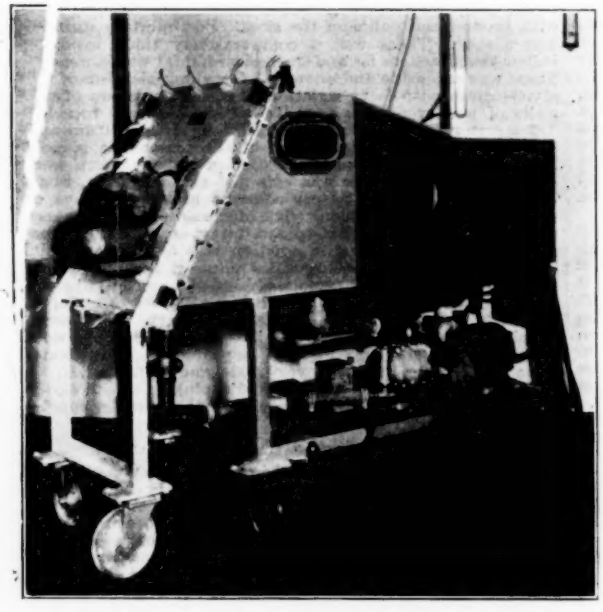
Severe apnœa can be produced on normal humans by intentional over-ventilation of the subject. In clinical practice the severely paralysed patient may be over-ventilated by increasing the depth of the respirations just prior to being withdrawn from the apparatus for a few minutes, in order that he may be bathed and changed. Without such over-ventilation he may become cyanotic too quickly to permit reasonable nursing care or medication.

This apparatus has had two years' trial in the United States and Canada and has been used in some 100 cases of respiratory failure from acute poliomyelitis, over 50 cases of unusually severe carbon monoxide poisoning, about 10 cases of alcoholic coma, 7 of drowning, 1 of post-diphtheritic paralysis, and over 30 of asphyxia of the new-born. In general the intercostal paralysis of poliomyelitis can be treated with immediate relief and comfort to the patient, the length of treatment varying from a few hours to several months, according to the severity of the disease. Cases of gas-poisoning, alcoholic coma, and drug poisoning seldom require more than 24 hours' treatment, while new-born babies rarely require over one to two hours' continuous treatment.

With the exception of those with poliomyelitis the patients usually recover completely. Numerous cases of both children and adults with severe intercostal paralysis from poliomyelitis have made gratifying recoveries, although we have several who have recovered the use of their intercostals but are otherwise crippled.

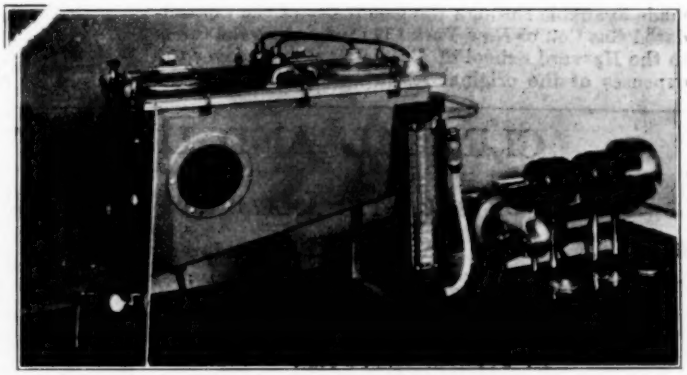
In view of the fact that over 70 of the adult machines and 12 of the infant size (Fig. 2) are in successful use in America, the

FIG. 1.



Respirator (for adults) showing patient in the apparatus. (Photographs by courtesy of Messrs. Siebe, Gorman and Co.)

FIG. 2.



Respirator for infants. The chamber is heated, when necessary, by two electric bulbs on the inside.

manufacturing details have been entrusted to Messrs. Siebe, Gorman and Co., of London, and the apparatus will be made here as desired by the medical profession. No profits will accrue to any person in any way concerned with the development or sale of the apparatus in America.

This apparatus was developed and subsequently made available through the generosity of the Consolidated Gas Co., of New York City, who gave the funds to the Harvard School of Public Health to cover the expenses of the original research, and later bought and presented 14 adult-sized respirators to various hospitals in New York City.

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# CLINICAL AND LABORATORY NOTES

## A CASE OF APLASTIC ANÆMIA.

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AND

A. TURNER, M.D. DURH.

A MAN, aged 52, complained of acute pain in the epigastrium, mainly dependent upon the taking of food and frequently appearing during the night. It had first been noticed some six months previously. Pallor and dyspnœa appeared three months later. There was nothing noteworthy in his previous medical history and no history of venereal disease. He had noticed a tendency to "bleed" from small wounds, and four years before had had an attack of epistaxis, for which his nostrils had been plugged. He thought that his family, especially on the male side, was more than usually liable to bleed.

He was very abstemious and smoked little. His normal weight was 14 st. 7 lb.; when first seen it was 14 st. His appetite was good, but he suffered from considerable pain and discomfort after meals, with occasional pyrosis. The bowels were regular, and no blood had been noticed in the motions. Vomiting had not occurred. The urine contained a trace of albumin but nothing otherwise noteworthy. On physical examination he was remarkably anæmic but without a lemon tint. A few purpuric spots were noticed on the mucous surfaces of the lips, but not elsewhere. The pulse-rate was 92 and the pulse was regular and of medium force; the radial wall was healthy. The systolic blood pressure was 146 and the diastolic 66 mm. Hg. There was nothing discoverable in the viscera of the chest or abdomen except such as might be directly associated with the anæmia. The teeth were poor and the tongue slightly furred. There was no œdema, no history of sweating, and no evidence suggesting associated disease of the central nervous system. The diagnosis appeared to lie between duodenal ulcer, gastric neoplasm, and pernicious anæmia.

An X ray examination after an opaque meal was made by Dr. Stanley Melville and the conclusion reached that, although the behaviour of the stomach was not typical of duodenal irritation, a definite residue at two and six hours made it impossible to exclude ulceration in this region. The result was thus inconclusive as regards the presence of ulceration but appeared to negative malignant disease. Examination of the stools for occult blood showed that this was present in moderate amount. The blood count made at the time was as follows: white blood corpuscles, 3200 per c.mm.; red blood corpuscles, 2,500,000 per c.mm.; hæmoglobin, 22 per cent.; colour-index, 0·44; polymorphonuclear leucocytes, 63·0 per cent.; eosinophils, 1·5 per cent.; basophils, 0·5 per cent. large hyalines, 6·0 per cent.; small lymphocytes, 29·0 per cent.; poikilocytosis, anisocytosis, and polychromatophilia were present, but no nucleated red cells were seen. The coagulation time was not altered. The result of the blood examination was thus not specially indicative of pernicious anæmia, but rather suggested an anæmia secondary to hæmorrhage from duodenal ulceration. The patient was accordingly put to bed and treated upon this supposition. No improvement was obtained; the occult blood persisted in spite of all forms of treatment, including injections of horse serum, and no marked change was noticed in the general condition.

A consultation was held with Mr. G. Gordon Taylor and, while the difficulties of the case were fully appreciated, it was felt that, with the history of gastric symptoms already detailed, the persistence of occult blood in the stools and the absence of any other form of bleeding, together with the obviously serious condition of the patient, it would be advisable to open the abdomen and search for ulceration. This was accordingly done, but nothing was found to throw light upon the symptoms. The patient made a successful recovery from the operation, no special tendency to bleed having been noted, and his general condition remained in statu quo. The teeth meanwhile had received attention. A course of treatment by liver was tried and he was subsequently transfused, but without success.

Blood examinations were made from time to time and, while some of the counts had features suggestive of pernicious anæmia, none was typical, and nucleated red cells were never found. It now became apparent that the case was a true blood disease to which the anæmia and hæmorrhages were secondary, and the diagnosis of aplastic anæmia was made. The patient returned home and died about nine months after our first consultation, all forms of treatment having proved unavailing. The final count made three months before his death was as follows: white blood corpuscles, 6200 per c.mm. red blood corpuscles, 1,750,000 per c.mm.; hæmoglobin, 25 per cent.; colour-index, 0·7; polymorphonuclears, 62·5 per cent.; eosinophils, 6 per cent.; lymphocytes, 30·5 per cent.; mononuclears, 6 per cent. The stained film showed marked poikilocytosis and anisocytosis was very evident; there was a considerable number of megalocytes. A few cells showed polychromasia, but there were no nucleated forms. The report added the suggestion that despite the low colour-index, this count had several of the features of a true pernicious anæmia.

### POST-MORTEM EXAMINATION.

The body was that of a well-nourished middle-aged man with pronounced pallor of the skin. Post-mortem staining was absent. There was a comparatively thick layer of yellow subcutaneous fat and the pericardial fat was increased. There was extensive and advanced fatty degeneration of the myocardium with fatty striation of the musculature of the walls of both ventricles as well as of the papillary muscles. There was an excessive deposit of fat in the omentum and mesentery, but no enlargement of the mesenteric glands. The intestines were normal; ulceration and neoplasm were both absent. The liver was enlarged and very soft, rusty brown in colour with deeper coloured areas suggestive of chronic passive congestion. The macroscopic appearances were consistent with widespread fatty change and some atrophy. The ferrocyanide reaction was only very slight. The spleen was a little enlarged, its pulp soft, and the normal markings lost. The cut surface presented a uniform appearance which might have been due to post-mortem changes. The kidneys were pale and apparently fatty, but showed nothing otherwise noteworthy. No special changes were observed in the pancreas and suprarenals. The bone-marrow of the femur was very pale and appeared to be mostly fatty, with the exception of a pinkish streak about 5 mm. in diameter. It was evident that erythrogenetic activity was inconsiderable.

### HISTOLOGICAL REPORT.

*Liver.*—No changes of special importance beyond passive congestion and areas of central atrophy and fatty degeneration.

*Lungs.*—Œdematous.

*Spleen.*—The most striking feature was the comparative absence of red corpuscles. The Malpighian corpuscles were very poorly represented and appeared to be inactive. The reticulum cells were also apparently diminished in number and the connective tissue reticulum of the organ was very evident, although no new formation of fibrous tissue had occurred. A very fine fatty infiltration of the reticulum was present. The ferrocyanide reaction was negative.

*Kidneys.*—Chronic interstitial nephritis was present, with a considerable amount of fat in the epithelial cells.

*Heart.*—There was well-marked fatty degeneration.

*Pancreas.*—No special change.

*Bone-marrow.*—The section was taken through the reddish streak previously mentioned as being the most likely area to show evidence of the presence of regeneration. Many cells were found with basophil cytoplasm containing larger or smaller masses of hæmoglobin. In some cells there were definitely one or more mature red blood corpuscles, which suggested that some erythrocyte destruction was in progress. No typical nucleated red blood corpuscles could be found. Of the white cells the most prominent were eosinophil granular leucocytes of the myelocyte type, but typical polymorphonuclear leucocytes were not common. Cells of the lymphocyte series were fairly numerous.

We are indebted to Dr. H. W. Vines, of the Charing Cross Hospital Institute of Pathology, for the post-mortem report.

Thus, while the gross changes in the viscera were similar to those in pernicious anæmia of the ordinary type, there were also important differences in that the bone-marrow showed an absence of new red cell formation and nucleated red cells were entirely absent. The ferrocyanide reaction in the liver and spleen was also absent or inconsiderable.

Apart from the extreme pallor and the gastro-intestinal symptoms, the latter of which ultimately yielded to treatment, the most noteworthy clinical features were the presence of occult blood in the stools which proved quite uncontrollable, resisting all forms of treatment, and a blood count resembling in some respects pernicious anæmia yet seriously differing from it and at first suggesting a secondary anæmia for which the persistent intestinal bleeding offered a primary cause. A further complicating factor was the suggested history of "bleeding" in the family confidently put forward by the patient. This led to an examination of his blood coagulation time, which nevertheless was found to be unaltered. It is unfortunate that the platelets were not specially noted in the blood examination.

There had been no free hæmorrhage either from the stomach or bowel, but a persistent oozing arising from the gastro-intestinal mucosa. The absence of nucleated red cells from the blood counts did not perhaps receive sufficient weight in the earlier stages of the patient's illness, but the serious general condition, the history of gastric pain and pyrosis, and the persistent loss of blood seemed to suggest the possibility of a gross gastro-intestinal lesion which it was advisable to deal with or exclude. It was accordingly dealt with, but not without much misgiving.

### DIFFERENTIAL DIAGNOSIS.

The case had all the appearances of an anæmia dependent upon persistent loss of blood, the main feature being a progressive fall in the number of red cells, accompanied in a general way by comparable changes in those characters usually associated with severe anæmia. A small apparent rise in polymorphonuclear cells may have been due to some septic complication; on the other hand, there was a small excess of lymphocytes. Thus intestinal hæmorrhage for which no gross lesion could be found, associated with a grave and uncontrollable anæmia, was the main clinical characteristic.

Post mortem the main change was found in the bone-marrow, which had the appearances consistent with failure of its normal erythrogenetic activities. Evidence of abnormal blood destruction in the liver and spleen was not found, as shown by the absence of the ferrocyanide reaction.

The clinical diagnosis between aplastic and pernicious anæmia depends upon a progressive fall in the red cell count and in the absence of any appearance of blood regeneration, together with complete resistance to all forms of treatment. It is of interest to note that even in an anæmia of such severity normal recovery from operative interference occurs. It was suggested in one of the blood counts already detailed that some of the characteristics of pernicious anæmia were present, and it may be a matter of some difficulty to decide between these two conditions upon blood examination alone. That there should be a certain amount of overlapping between aplastic and pernicious anæmia might perhaps be expected, for it is highly improbable that the erythrogenetic properties in the marrow of all the bones should be equally affected or should entirely fail, for the end would come when blood regeneration fell short of bodily requirements—when the balance between red cell production and destruction was so far disturbed as to be incompatible with life. Meanwhile, it is conceivable that the cells formed by the failing bone-marrow would be less resistant than normal to ordinary destructive influences and that a certain clinical resemblance to pernicious anæmia might be produced in this way.

Aplastic and pernicious anæmia appear to be blood diseases probably unconnected with each other except in so far as they occur at different phases in the life-history of the red cell. The former is a failure of red cell production; the latter an excess of red cell destruction.

Glossitis, achlorhydria, and degenerative changes in the central nervous system are absent. The colour-index of the blood and the hæmoglobin content of the red cells are variable and may be unreliable for differential diagnosis, which must be based upon the presence of a wholly intractable anæmia, with or without hæmorrhage from the mucosæ, along with a blood picture characterised by great reduction in the number of red cells and an entire absence of the features commonly associated with red cell formation. The duration of the disease varies through narrow limits and is almost invariably fatal.

*References.*—Sheard, Arthur: A Contribution to the Study of Pernicious Anæmia and Aplastic Anæmia, 1924. Minot in in Oxford Medicine, 1926. Davidson, L. S. P., and Gulland, G. L.: Pernicious Anæmia, 1930.

## A CASE OF MENINGITIS CAUSED BY STAPHYLOCOCCUS AUREUS.

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Meningitis caused by the *Staphylococcus aureus* is rare enough to make the following case worthy of note.

The patient was a female, aged 11 years, and was admitted to the North-Western Hospital on Feb. 18th, 1931, certified as suffering from cerebro-spinal meningitis, with a history of headache, vomiting, and constipation dating from Feb. 12th; there was also a history of intermittent vaginal discharge during the preceding 18 months. Retraction of the head was noticed on Feb. 17th.

On admission the temperature was 101·6° F., the pulse-rate 112, and the respiration-rate 22. There was marked head retraction and arching of the back, with increased knee-jerks and a marked Kernig's sign. The pupils were equal and reacted normally, and the mental condition was perfectly rational. Vomiting occurred twice on the day after admission but was not a marked feature, being absent until March 4th, when it became very persistent and remained so until the end. Headache was only slight, but head retraction and arching of the back steadily increased until finally both

were present in an extreme degree. The patient slept well and remained moderately quiet until Feb. 24th, when a generalised serum urticaria, accompanied by great restlessness and shouting, supervened. A brownish vaginal discharge was noted on this date. On the following day she was more drowsy, and speech became slow and slurring. Dysphagia appeared on Feb. 27th, increasing in severity until, on March 1st, nasal feeding became necessary. Shouting and restlessness reappeared on Feb. 27th and continued until exhaustion supervened. Death took place on March 6th. Pyrexia was not marked, the temperature never exceeding 102° F. until immediately preceding death. For the first week it fluctuated between 99° and 102° F., then remained roughly normal for three days, when it again rose and remained elevated until death occurred.

### TREATMENT.

Lumbar puncture was performed on admission, under general anæsthesia, when 30 c.cm. of turbid fluid escaped under increased pressure and, in view of the appearance of the fluid and the certified disease, 15 c.cm. of Lister's antimeningococcal concentrated serum was given intrathecally. This procedure was repeated on Feb. 19th, 20th, 21st, 23rd, and 25th, when turbid fluid varying from 36 c.cm. on the 19th to 15 c.cm. on the 25th escaped. On the latter date the fluid was thick and purulent, and there was no increase of pressure. At this point it was thought probable that a blockage had occurred in the spinal canal which was preventing proper drainage by lumbar puncture; accordingly, on Feb. 26th, a puncture of the cisterna magna was performed, 32 c.cm. of turbid fluid escaping under pressure and 10 c.cm of Lister's serum being injected; lumbar puncture on the same occasion yielded only 3 c.cm. of purulent fluid. Cisternal and lumbar puncture were repeated on Feb. 27th and 28th, March 2nd and 3rd, but as bacteriological reports had all been negative as regards the meningococcus the administration of serum was discontinued. On March 3rd an attempt was made to wash out the spinal canal with distilled water through the needle in the cisterna magna to the lumbar puncture needle which had been left in situ. The procedure was unsuccessful, no fluid escaping from the lumbar puncture; the fluid was therefore allowed to escape again from the cisternal puncture needle.

The only drug treatment was the administration of a sedative mixture and of a single dose of morphia on the day preceding death.

### PATHOLOGICAL INVESTIGATIONS.

These were mostly carried out at the Council's laboratory at the North-Eastern Hospital, where seven specimens of cerebro-spinal fluid were examined and reported upon. Four had been obtained by lumbar puncture and three by cisternal puncture. A pure culture of *Staphylococcus aureus* was obtained in all but the first lumbar puncture specimen, from which a few colonies of a Gram-negative diplococcus were grown. This organism, however, proved not to be the meningococcus.

Cell counts showed a marked polymorphonuclear leucocytosis ranging from 10,000 per c.mm. in the first lumbar puncture specimen to 300 per c.mm. in the cisternal puncture specimen obtained on March 2nd. Reducing sugar was absent in all the lumbar puncture specimens and present in moderate amount in all cisternal specimens.

When it was definitely established that the *Staphylococcus aureus* was the infecting organism, search was made for a septic focus. Examination of a smear and culture from the cervix uteri showed only a Gram-negative coliform bacillus. Examination of the ears was negative but a blood culture made on Feb. 27th gave a pure culture of *Staphylococcus aureus*; there were about 50 colonies per c.cm. of blood.

### AUTOPSY.

A post-mortem examination was carried out on March 7th.

*Head.*—The meninges and brain appeared normal except for some engorgement of the occipital region, probably due to hypostasis. Both middle and internal ears were opened and the left middle ear was found to contain thick yellow pus. A culture tube was inoculated from this pus and a pure culture of *S. aureus* obtained.

*Spinal Canal.*—On exposing the spinal canal the theca appeared normal externally but on incision the spinal cord was found to be surrounded with thick yellow pus. This was most profuse in the lumbar region and extended, though in diminishing amount, as far upwards as the upper dorsal region. Sections were made of the cervical, dorsal, and lumbar regions. The cervical region showed congestion of the blood-vessels and a definite, though not marked, meningitis. The large motor cells showed marked degenerative changes—i.e., disappearance of granules and breaking up of nuclei. The dorsal region showed similar congestion and degenerative changes in the larger nerve-cells. In the lumbar region the meninges showed much more definite meningitis, with abundant polymorphonuclear cells and fibrin on the meninges and around the nerve roots. Masses of staphylococci were present. The larger nerve-cells showed the degenerative changes described above.

*Thorax.*—The pleura, pericardium, and heart were normal. In the lower part of the upper lobe of the left lung about half a dozen small nodules were found; on section these showed changes varying from acute œdema through bronchopneumonia to definite abscess formation.

*Abdomen.*—Nothing abnormal was found in the abdomen except that the liver was dark on section and engorged with blood; the Fallopian tubes were a little congested, the cervix uteri was a little patulous and the endometrium was slightly discoloured with altered blood towards the cornua.

### DISCUSSION.

This appears, from the bacteriological and post-mortem findings, to have been a case of staphylococcal meningitis which had its origin in the middle ear. The otitis media was followed by a septicæmia with metastatic abscesses in the lungs, but whether the septicæmia or the meningitis occurred first is a matter of some doubt. Certainly there was no evidence of direct spread from the ear to the meninges. There was no septic focus in the uterus or vagina, and the post-mortem appearances and history of intermittent vaginal discharge were consistent with an abnormally early onset of menstruation.

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INCREASE OF OUT-PATIENTS.—It was stated at the annual meeting recently of the Royal National Orthopædic Hospital, Great Portland-street, that, whereas 20 years ago there were 22,000 out-patients' attendances, last year there were 111,000. Although the cost of maintenance in both departments has been reduced, there is still a debt of £40,000.

NEW SUSSEX HOSPITAL FOR WOMEN AND CHILDREN. Princess Mary visited Brighton on May 8th to open the new John Howard wing of this hospital. The trustees of the late Sir John Howard had generously allocated £5000 for building and £20,000 for endowment of this extension, which comprises a ward of cubicles containing 12 beds for poorer patients and six bedrooms for private patients. Miss L. Martindale, M.D., the senior surgeon, made particular mention of the work that is being done at this hospital for the treatment of cancer. In conjunction with three London hospitals the N.S.H. has the use of £12,000 worth of radium. Facilities for encouraging patients to seek early advice was emphasised as one of the aims to be achieved in enlarging the out-patients' department. In connexion with the official opening a public luncheon was held at the Dome with Mr. A. O. Jennings in the chair. Countess Buxton responded to the toast of the hospital and the Sir John Howard Trust. Dame Louise McIlroy, M.D., strongly urged the continuance of the voluntary system, and Miss Irene Vanbrugh made an appeal emphasising the ever-growing requirements of the out-patients' department of the hospital. Over £200 was collected and later presented to Princess Mary.

# MEDICAL SOCIETIES

## CHELSEA CLINICAL SOCIETY.

AT a meeting of this society held on May 19th, Mr. F. J. MCCANN, the President, being in the chair, a discussion on

### Treatment Before and After Operation

was opened by Mr. LAWRENCE ABEL. The art of surgery, he said, was as old as mankind, but the science of surgery, as known to-day, had its seed sown by Joseph Lister. The greatest pre-operative discovery of all time was that of general anæsthesia, for it robbed operations of their outstanding terror—namely, pain. But before this discovery surgeons did not omit provision for lessening the emotional state of the patient before an operation, in illustration of which Mr. Abel read an abstract from the pre-operative injunctions of Sir Astley Cooper before proceeding to operate; "a very elaborate ritual," he remarked. Even now there remained a dread of operations, and even Lister's work did not ban many mediæval practices.

#### BEFORE.

In considering the patient's fitness for the contemplated operation, the first matter to be investigated was the condition of the heart and the blood pressure. The difference between the diastolic and systolic pressures was known as the "pulse pressure"; the percentage ratio between the pulse and diastolic pressures was the "cardiac energy index"; the normal figure varying between 25 and 75. The cardiac index gave a valuable indication of whether or not the patient had a good chance of surviving the operation. Any doubt on this score should be resolved by taking an electrocardiogram. Especially in hyperthyroidism an ordinary basal determination was necessary to determine the general metabolism, and the lung condition should be inquired into, with a skiagram to supplement if necessary. To look into the genito-urinary system the urine was tested by culture for organisms and by urea concentration. If this was omitted it might be found that the kidneys would not bear the anæsthetic or the post-operative period. The hæmoglobin and urea content of the blood should be estimated, a blood count taken as well as ascertaining the blood group. Should there be any question of jaundice or hæmophilia, the clotting time must be known, also the blood chlorine and cholesterol. A Wassermann test must be included. The degree of thoroughness of this investigation could vary with the severity of the contemplated operation. In a general way, there must be some rest before the operation; several days in bed before a severe operation.

The modern view on purgation before operation was that the patient's normal excretory functions should continue; no aperient other than the accustomed one should be given. Castor oil as often given was a factor in producing dehydration before operation; it gave rise to grossly irregular peristalsis, with stirring up of the intestinal fauna and flora, and not infrequently to impaction of fæces. It might even cause paralytic ileus. Castor oil was, he thought, responsible for more empty cots than any other single cause he knew. In major operations on the large intestine and rectum after several days' preliminary aperients and lavage the bowels should be allowed to rest for two clear days before operation. What was most potent in maintaining the patient's reserve, keeping up the carbohydrate metabolism, and preparing him for the anæsthetic and the insult to his tissues, was glucose. This should be administered, in greater or less degree, to all patients about to undergo operation; it could be given as barley sugar or added to orange or other juices. The patient's ordinary diet should be continued to within three hours of the operation, glucose being added to the drinks taken. Especially on the night preceding the operation should sleep be sound; this could be ensured if necessary by one of several drugs. On the day of operation the aim was that the patient should go to sleep in his bed, and wake up in the same place some hours after the operation. He used a combination of omnopon and scopolamine. Frequently that put the patient to sleep in a few minutes, and after the operation he might not know he had been away from his bed. In using hyoscine it was important to realise that this drug contained two alkaloids; the effect of one was stimulating, the other sedative. These forms were not standardised in the British Pharmacopœia; he therefore procured hyoscine of the sedative type from the continent. Rectal injection of avertin he used occasionally in submaximal doses, but not for abdominal cases, as it caused post-operative paresis of the intestine; nor in cases likely to bleed much. The barbiturates had a distinct sphere of usefulness. Only one anæsthetic was proof against criticism—namely, nitrous oxide and oxygen. This anæsthesia was pleasant to the patient, it was never associated with post-operative complication, after it vomiting was practically unknown; it could be used in young and old, and for every type of operation. Even so, it should be given by a skilled anæsthetist. There was no excuse for using chloroform; it was a powerful poison and should be found only in the hospital museum.

So far, said Mr. Abel, he had presupposed the patient to be in a normal state except for the trouble calling for the operation. No major operation on the mouth or pharynx should be done until the teeth were in a satisfactory condition. Preferably the patient should be edentulous. If heart or lungs were defective, the choice of anæsthetic should receive special consideration. Should the hæmoglobin be less than 50–60 per cent., the operation should be deferred pending feeding up or blood transfusion. If the urea was high, the bladder should be drained, either through a catheter, or suprapubically. Diabetes or excess of sugar in the urine must be recognised before operation and treated accordingly. He always carried glucose and insulin with him when operating in suburbs or provinces. If the projected operation was to be on the biliary passages, jaundice or any hæmorrhagic state must have suitable treatment, with the object of avoiding severe hæmorrhage after the operation. He recommended the intravenous injections of calcium chloride, 10 c.cm. of a 10 per cent. solution, combined with injections of 15 units of parathyroid extract. In jaundice, 500–1000 c.cm. of 10 per cent. glucose in normal saline should be given intravenously the day before operation. If the hæmoglobin was less than 50 per cent. or red cells less than 4,000,000, blood should be transfused. If no anæmia was present, blood transfusion was better deferred until after the operation; then one was sure of a pint of non-anæsthetised blood being in the patient, with a stimulation of the bone-marrow to blood-cell

production, and mobilisation of the blood cholesterol. For shocked patients the great standby was morphia. If vomiting occurred before the operation the stomach should be washed out.

AFTER.

In the constitutionally normal patient after operation two factors had to be combated: shock, and the effects of the anæsthetic. For the first of these, warmth was very important: gamgee tissue jacket and hot electric blanket, rest in bed, heroin or morphia, with injections of glucose in normal saline per rectum, subcutaneously or intravenously. Failure of respiration was best treated by injections of alpha lobeline. After an operation which was sure to be followed by considerable shock 500–750 c.cm. of blood should be transfused, preferably before the patient left the table. This measure had resulted in a definite lowering of the mortality after some severe operations, such as that for carcinoma of the rectum. With the patient sitting up there was less danger of lung complications.

About diet there was still much difference of opinion; the question was specially important in abdominal cases. He believed in as complete rest as possible to the alimentary canal. After operation, Nature placed the abdomen at rest, the muscles protectively formed a splint, and peristalsis was inhibited by the painful impulses from the operation site. If the patient had been guarded against dehydration before operation, thirst was not likely to be intense. To allay it the chewing of pineapple chunks might be allowed, the fibre being put out. Milk should be deferred for three or four days; when given it should at first be peptonised. After operation no purge should be given until the bowels of themselves showed signs of activity. After the second day an enema was given; he found turpentine, black treacle, or ox gall very satisfactory. No tubes should be left in the abdomen longer than 36 hours, otherwise there was a liability of spread of infection from skin inwards. Usually his patients were sitting about the ward on the third day after operation; if they could be gently on the move there was less danger of complications and of abdominal weakness.

A serious result of combined anæsthetic infection and shock was disturbance of the carbohydrate metabolism. There was now, he said, a general feeling that what was formerly known as acidosis did not exist as a common post-operative condition; what occurred after operation was rather a state of alkalosis. Whether a patient had excess of alkali in the blood stream or an excess of acid depended on the relative loss of water or salt. If the patient was dehydrated, an acid condition supervened; if the loss of salt was predominant, the patient had alkalosis, even though the urine might be acid. The loss of chloride due to vomiting and to the anæsthetic lowered the osmotic pressure of the blood, leading to retention of bicarbonate in the blood plasma. It occurred sometimes in those who had taken considerable alkali for medical reasons. In a difficult case it was impossible to distinguish between alkalosis and acidosis without making a chemical examination of the blood. Paralytic ileus and acute dilatation of the stomach were caused by excess of alkali in the blood. The prevention of alkalosis consisted in giving 10 per cent. glucose in normal saline per rectum by means of Murphy's drip. If a patient vomited 24 hours after operation, the stomach should be washed out. Some preferred duodenal drain for this. In paralytic ileus pituitrin and cathartics should be carefully avoided; they were like flogging a dying horse. Sodium chloride, with glucose, should be given intravenously for several days. Paralytic ileus was associated with vagal paralysis and the formation of a toxin, similar to that of *B. welchii*. Mr. Abel had had many successes in desperate cases following the use of the direct vagal stimulant, acetylcholine, and with anti-gas gangrene serum.

### Discussion.

Mr. CECIL ROWNTREE spoke of the importance of the psychological aspect, which predominated to the patient. Nowadays surgeons had the privilege of working in association with anæsthetists who were keenly alive to this. Patients did not now fear that they would feel pain, but they dreaded the atmosphere of the surgery. Mr. Rowntree agreed that gas and oxygen was the ideal anæsthetic, but it was not always possible to secure its expert administration. Sometimes the patient strongly insisted that his own doctor should give the anæsthetic, and he chose ether, so that this was the drug the patient got—more or less. Every means should be used to ensure skilled anæsthesia. Unlike Mr. Abel, he believed in castor oil in operation cases; having given it, he knew there would be no prolonged distension, and he thought it cut out many post-operative difficulties. He did not see post-operative ileus in his practice, and that might be because he gave castor oil. He had a practical suggestion to offer: it would be a real advance if there were "pre-operative beds" in hospitals; these would be in charge of an enlightened physician—i.e., a physician with surgical leanings—who would assess and report on the risks of each patient.

Mr. H. P. WINSBURY-WHITE said that in urological cases it was very important to avoid diagnostic instrumentation within a short time of the proposed operation. He referred, for instance, to cystoscopy in cases of enlarged prostate. After cystoscopy, a proportion of patients developed retention of urine, while some would have catheter fever—a very unpleasant occurrence before operation. Another undesirable procedure was instrumental pyelography. Intravenous pyelography had now been introduced, and had largely done away with the necessity of the instrumental method. In dilated kidney, where the opaque medium was introduced and could not be withdrawn because there was obstruction, there might be considerable reaction from the irritant medium. When instrumentation was essential a sufficient interval should afterwards elapse before operation. After urological operations careful and unremitting attention should be given to the patients; the surgeon must decide when he would cease irrigation, whether he would use drainage-tubes, and also urethral instrumentation. Bad judgment in these matters was liable to precipitate a dangerous crisis. In preparing bladder cases for operation he had found castor oil excellent; admittedly its post-operative use was bad. For prostate cases, nitrous oxide and oxygen was a good anæsthetic, and he preferred the addition of a little ether. He had seen no disadvantage from the ether.

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ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.—The number of new in-patients (268), new out-patients (11,824), and out-patient attendances (53,266) last year were all the largest on record, and the annual report notes, as a sign of the recognition of the hospital as a treatment centre for skin diseases, that a third of the new out-patients were sent by medical practitioners. The weekly cost of in-patients (268) has been reduced from £3 11*s.* 11*d.* to £3 3*s.* 10*d.* The length of stay averaged 36 days as against 41 in 1929.

# THE INTER-STATE POST-GRADUATE ASSEMBLY OF NORTH AMERICA.

THIS association met in London at the house of the Royal Society of Medicine on May 26th, when Sir THOMAS HORDER, chairman of the British Isles committee, welcomed the delegates and gave an address entitled Some Medical Hints. He deplored the replacement of the aphorism in medical teaching by the lengthy article, and began with some aphorisms on alcohol.

## Alcoholism.

The acquired causes of the alcohol habit, he said, were mainly psychological: the drab life of the poor, the ennui of the rich, the state of "misère," and success achieved too early. Alcoholic beverages at the end of the day tended to promote sleep in those accustomed to them and insomnia in those unaccustomed to them. Anomalies of temperature in illness were not seldom explained by alcoholic addiction; morphia might produce the same effect. Spirit-drinking was a potent cause of inflammation of the whole alimentary tract, from gingivitis to colitis and proctitis. Symptoms of duodenal dyspepsia were not infrequently the result of relative excess, and the discomfort was often relieved by resort to the cause—no doubt one of the explanations of the aperitif habit. Hunger with discomfort was relieved by the cocktail, but demanded increasing amounts of the remedy. Alcoholics tended to bleed more often and more profusely than non-alcoholics; hæmatemesis, hæmoptysis, and hæmaturia were all examples. The prognosis in alcoholic cirrhosis was uniformly bad in hospital patients, especially when ascites appeared, but was often better among private patients. In considering the prescription of alcohol in diets it should be remembered that the physician's principle in ordering a regimen was not the most meagre diet on which the patient could live but the diet on which he could live most comfortably and efficiently. The withdrawal of alcohol in the cure of alcoholism must be determined by the individual case. If the main indication was physical—if a tissue craving had been established—the gradual method was probably essential, but if the main indication was psychological, it was often more dramatic and therefore better to break altogether, but the patient must be under close observation. Success depended on the absence of disappointment. A frank talk with the patient and his agreement were a sine qua non. In doubt, the gradual method was probably safer. In prognosis, the doctor's confidence in the patient's ability to abstain should be in inverse ratio to the patient's own confidence.

## Influenza and Some Abdominal Conditions.

There was no exact criterion in the diagnosis of influenza; the nearest approach was a clinical picture more easily recognisable during an epidemic than at other times and varying in different epidemics. The most characteristic lesion was pulmonary—an acute bronchiolitis with weak breath sounds and copious small râles. The signs often seemed quite inadequate to explain the degree of illness and the persistence of the pyrexia. It was a fallacy to think lightly of congestion of the lung. A frank lobar consolidation was far better than a series of congestive patches with no hope of a crisis. The most helpful therapeutic agent available was fresh air, and it was all too often denied to the patient. "A draught" was just what he wanted, but he was often "cooked" with excessive blankets; the amount of bedclothes should be determined by the temperature and not by the patient's feelings. Cradling and sponging were useful.

Abdominal examination was of vital importance. The abdomen should be inspected from the head and foot of the bed as well as from the side, and from the level as well as from above. The question of symmetry was vital; the human abdomen in health was absolutely symmetrical. Auscultation was generally omitted altogether, but every now and then it yielded information of the highest value—e.g., perisplenic friction; or a bruit over a hypernephroma, suggesting a blood-vessel of such magnitude that the patient would be unlikely to survive removal. The distinction between pain and tenderness was significant. The gall-bladder, being contracted and adherent, was often impalpable in cholecystitis. Tuberculous peritonitis was much more often diagnosed—correctly—in the absence of direct evidence of tuberculosis than of its presence; the disease was more often than not confined to the abdomen, especially in children. Even ascitic fluid often gave negative response to tests. One of the most decisive clinical signs was the formation of indurations; these must be distinguished from encysted fluid, tubo-ovarian mating, and appendicular inflammation.

Gastric ulceration was not necessarily malignant because the patient was elderly; age of itself gave no help in differential diagnosis. A frank hæmatemesis highly favoured a diagnosis of simple ulcer. Cancer of the stomach and colon was a disease sui generis and was not grafted on chronic ulcer, inflammation, or displacement. The commonest history in carcinoma of the stomach was perfect digestion up till a few months before the patient was first seen.

Mr. DONALD ARMOUR spoke on the

## Treatment of Head Injuries.

The treatment, he said, concerned not only the immediate recovery of the patient, but also his ultimate restoration to normality. The damage to the contents was far more important than the injury to the skull itself. "Minor" head injuries often had major sequelæ, and were too frequently neglected. He outlined the anatomy and physiology of the cerebro-spinal and cerebral blood circulations. A delicately balanced equilibrium was maintained, he said, between the production and absorption of cerebro-spinal fluid and the osmotic and hydrostatic pressure of the blood, but gross changes in blood pressure affected the cerebro-spinal fluid pressure. The intracranial pressure depended on five factors: the volume of the blood in the brain, cord, and coverings; the volume of the cerebro-spinal fluid; the volume of the brain; and the tension of the dura and skull. The normal positive pressure depended on the closed-box system of the cranium, variations in volume of either the fluid, blood, or brain being compensated by variations in one of the other two—i.e., in practice by expression of fluid or blood. The margin for their elimination was small, and any increased pressure was bound soon to produce symptoms. Mr. Armour then described the symptoms of interference with the cranial circulation, and the stages of compensation, venous stasis, and cerebral anæmia. If the symptoms were produced by sudden pressure, much greater than that of the blood, the skull was distorted and might or might not be fissured. The effects of deformation were not revealed by inspection of the skull. Early X rays were there-

fore useless in head injury, and constituted a pitfall in prognosis. The sudden very great increase in intracranial pressure affected all systems, but the choroid plexuses were particularly vulnerable. Symptoms were due to hyperacute compression, producing general cerebral anæmia, and to contusions caused by the deformation of the skull. Any injury of the brain produced œdema leading to venous stasis. Hæmorrhage was the most important result of injury in the production of symptoms, and its rate of progress was the most significant factor. It was important to ascertain the intracranial pressure with a view to prognosis and treatment. The blood pressure was no guide, but the manometric estimation of cerebro-spinal fluid pressure was of the utmost value. Normal pressure varied over a wide range, but pressures above 250 mm. of water were suspicious and over 300 mm. definitely indicated pathological change. Examination of the optic discs for papillary stasis was helpful. Early ocular signs were dilatation of the retinal veins, followed later by blurring of the edges. In local compression ophthalmoscopic examination might have localising value, and the veins of the scalp, forehead, and eyelids might confirm the diagnosis. The absence of blood in the cerebro-spinal fluid did not exclude hæmorrhage, but it seemed that both acute and chronic changes in the central nervous system followed the introduction of blood into the fluid; neuralgic headache, delirium, slight increase of pulse-rate and pyrexia, Kernig's sign, and post-cervical rigidity. The irritating blood should be removed by lumbar puncture or decompression. The value of lumbar puncture was not fully appreciated; in milder cases of tension it often postponed operation until a better time or obviated it. It mitigated the headache, irritability, and vertigo of patients not needing decompression. Intravenous or oral hypertonic saline or glucose reduced intracranial tension; magnesium sulphate had been found to be better than sodium chloride, but the least toxic and most effective solution for intravenous use was dextrose. Cases not requiring operation should be kept in bed, propped up (to reduce pressure), and kept free from all forms of external stimuli. Mild sedatives and purgatives—preferably magnesium sulphate—should be given.

No operation was indicated if there was no increase of tension—i.e., in about two-thirds of the cases of head injury. No operation whatever should be performed during the period of initial shock or in the terminal stage of medullary œdema and collapse. In the absence of increased pressure operation was not indicated. The ideal period for intervention was the stage of capillary anæmia, as shown by a slow pulse and slight rise in blood pressure, in time to avert medullary compression. It was most important to note whether the degree of coma varied with the cerebro-spinal fluid pressure. Mr. Armour then described the operation of decompression.

Dr. STRICKLAND GOODALL spoke on

### The Right Ventricle.

He thought that the right ventricle was apt to be neglected. Its function was to supply energy for the pulmonary circulation. The efficiency of the right heart depended on adequate filling, myocardial integrity at the pulmonary base, an efficient tricuspid tensing mechanism, and free outlet. The ventricular contraction started in the right papillary muscle, which tensed the tricuspid valve. The bundle system constituted a large motor end-plate and distributed the stimulus throughout the whole of the myocardium. The tricuspid valve might become inefficient through dilatation of the ring to which it was attached; through direct damage, as in endocarditis, or through damage or inadequate stimulus to the right papillary muscle. The contractility of the pulmonary base might be affected by infarction or interference with its blood-supply, or by interference with its nerve-supply. The right branch of the bundle of His consisted of two main branches: one crossed in the moderator band to the right papillary muscle and the other arbourised round the pulmonary base. If the main branch were damaged, both valve and base were damaged and the right ventricle only acted by overflow from the left. If, however, the tricuspid branch only was affected the electrocardiographic picture would show normal $T_1$ but very small $R_2$. The electrocardiogram showed what the heart muscle was doing, but did not show why. If the base branch was damaged the result would be defective contractility with only secondary reflux through the valve. The T wave in the first lead could thus be inverted in two ways.

The most important relation of the right heart was the stomach which in the young lay immediately beneath it and was fitted with an automatic release to regulate gastric pressure. Therefore in youth there was never any real effective pressure on the heart. With age the arteries lengthened, the heart lost tone, and became triangular and came down on the stomach, which by this time had lost its automatic release so that its pressure varied with its contents. A hard stomach came into contact with a soft heart, and might start fibrillation, extrasystoles, a right ventricular paroxysmal tachycardia, or an anginal attack. In Dr. Goodall's experience, 80 per cent. of heart cases first got symptoms after a meal, and 70 per cent. of unexpected deaths occurred after a meal. Every heart case should be dieted and the stomach attended to from the first. Mechanical embarrassment of the heart should be remediable. Cases could only be properly treated after cardio-analysis.

With age, or after infective diseases, the heart became atonic, sessile, or "concertina"; this was no more characteristic of syphilis than of any other infection. This heart was a large heart, an inefficient heart, a soft heart, boot-shaped in X ray, and showing a slapping apex-beat, with inversion of the T wave in lead III. and left-sided preponderance, and it was often irregular, owing to extrasystoles. It often developed right branch block—obviously enough, since the right branch of the bundle of His was responsible for right ventricular tone. Right branch block might be temporary, during anginal attacks, before death, or in acute right-heart strain; it was often the underlying cause of chronic cough. The commonest variety of block was in the branch going to the papillary muscle and the least common was in that going to the base. There were four main causes of block: mechanical strain, arterio-sclerosis, syphilis, and rheumatism. The prognosis in syphilitic cases was very bad; it was better in the arterio-sclerotic and best in the rheumatic group. Right branch block was not very common in mitral stenosis.

The coupling beat due to overdose of digitalis was always an extrasystole and usually started in the right ventricle, because digitalis was usually given to patients with right-heart strain, and the first expression of poisoning appeared in the most damaged part. If a left-heart failure were poisoned by digitalis the left heart was coupled. Prognosis in mitral stenosis was grave if the T wave in the first lead was poor, indicating thin myocardium about the pulmonary base.

# REVIEWS AND NOTICES OF BOOKS

## The Medical Annual, 1931.

Edited by CAREY F. COOMBS, M.D., F.R.C.P. Lond., and A. RENDLE SHORT, M.D., B.S., B.Sc., F.R.C.S. Eng. Bristol: John Wright and Sons, Ltd. 1931. Pp. 603. 20*s*.

## L'année médicale pratique.

Edited by Dr. CAMILLE LIAN. Paris: René Lépine. 1931. Pp. 635. Fr.26.

WITH this edition the "Medical Annual" reaches its forty-ninth year of useful service to the profession. A number of new treatments for everyday ailments are described, some of which will be of great value to the practitioner. As an example may be quoted the method of firm strapping for chronic ulcer of the leg—a simple procedure which will constitute a great advance if the well-supported claims for its efficacy prove to be justified. Another simple and apparently valuable measure is the "hydration treatment" of epilepsy, while insulin has found two more fields of usefulness in anorexia nervosa and diphtheria. The articles on food and the public health bring out two points which may prove to have great importance: the use of antitoxin for botulism and the increasing incidence of *Brucella abortus* infection. Recent advances in the treatment of colitis and diverticulitis, alcoholism and drug addiction, and high blood pressure are described in detail. Studies in the endocrine system have revealed a hyper-insulinism, analogous with hyperthyroidism, and the usefulness of surgical treatment for osseous disease associated with cyst or tumour in the parathyroid gland. Fresh light is being thrown on blood diseases; for instance, those in which the leucocytic picture is grossly altered, and pernicious anæmia. From studies in the latter disease has been established the interesting fact that persons with a defective secretion of hydrochloric acid are more liable than others to certain diseases. The shortage of hydrochloric acid in the asthmatic child is another observation which may lead to therapeutic developments. The practitioner will find useful hints on the treatment of painful heel, burns, and rectal prolapse. A section new to this volume is that on affections of the teeth, which stresses the value of proper diet and of sunlight. The value of submammary saline infusion before any active interference is undertaken in cases of placenta prævia is discussed in the midwifery section. The section on ophthalmology describes a new occupational disease—a conjunctivitis contracted in the artificial silk industry. The use of contact glasses for conical cornea of ignipuncture for detached retina, and the diagnosis and treatment of pink-eye are discussed. The volume includes, besides its clinical material, an index of new preparations and appliances, a classified list of the books of the year, and of medical institutions, homes, spas, and periodicals, and an official and trade directory, all efficiently indexed. It will be as welcome to the profession as were its predecessors.

The tenth volume of the French equivalent of our Medical Annual includes an index of the volumes from 1927 to 1930. It is a useful little book, though less exhaustive than its British prototype. Illustrations are lacking, except for some electrocardiograms in the article on angina, and two photographs illustrating correction of mammary atrophy by omental graft. The list of contributors is a distinguished one, and the book should be of interest to English as well as French practitioners. It contains, in addition to therapeutic material, a review of those legal enactments passed during the year which concern medical subjects, and a list of pharmaceutical specialties, instruments, and books.

## Surgery. Its Principles and Practice.

Fourth edition. By ASTLEY PASTON COOPER ASHHURST, A.B., M.D., F.A.C.S., Professor of Clinical Surgery in the University of Pennsylvania. London: Henry Kimpton. 1931. With 15 coloured plates and 1063 illustrations. Pp. 1189. 45*s*.

THIS text-book of surgery owes much to the clinical experience, judgment, and care of its author. Since practically all of the 1063 illustrations are original and are taken from the author's own cases, we can expect to find in the text the considered opinions of a surgeon of wide knowledge and experience. The work reads pleasantly, and is free from the repetitions of descriptions culled from other sources which make too many text-books dull. The matter is divided into three sections—general, systematic, and regional surgery, and clear, concise descriptions of operative procedures are given, one method of operative treatment at least for each pathological condition. Special regions are dealt with only in so far as they fall within the province of the general surgeon, but within this limit they are adequately discussed. The work is beautifully printed and bound, and the illustrations are well selected and well produced. Dr. Ashhurst has spared no pains in securing illustrations, and, if only for this reason, his book is admirably suited to the needs of the student, whose opportunities of seeing the less common conditions are, of necessity, scant.

## Bright's Disease.

*Observations on the Courses of Different Types and on the Resultant Changes in Renal Anatomy.* By a Group from the Hospital of the Rockefeller Institute for Medical Research, consisting of: DONALD D. VAN SLYKE, EDGAR STILLMAN, EGGERT MOLLER, W. EHRICH, J. F. MCINTOSH, L. LEITER, E. M. MACKAY, R. R. HANNON, N. S. MOORE, and CHRISTOPHER JOHNSTON. London: Baillière, Tindall and Cox. 1930. Pp. 130. 13*s*. 6*d*.

THIS work, which previously appeared in the journal *Medicine*, is now reprinted as Vol. XVIII. of "Medicine Monographs," and so is available in handier form. Many medical men interested in the subject will be glad to preserve what is one of the most valuable publications of recent years concerning Bright's disease. The bulk of its contents is made up by full case reports illustrative of the various types of nephritis, and it is noteworthy that the group of workers responsible adopt, with very minor change, the classification of Volhard and Fahr—that is to say, they recognise three main groups: a hæmorrhagic group, primarily affecting the glomeruli; an arterio-sclerotic group, corresponding to the ischæmic group of many modern writers; and, lastly, a degenerative or nephrotic group. Full accounts of the biochemistry are given in all cases, and the inclusion of post-mortem findings in each instance permits clinical and biochemical data to be accurately coördinated with the histology. English

observers familiar with the detailed histology contained in the monograph by Dorothy Russell (Medical Research Council Special Report Series, No. 142) may find the section on morbid anatomy in this volume somewhat disappointing. The American publication, if less exhaustive in detail, is easier to follow, and the adequate attention given to biochemical findings is satisfactory. The student who is accustomed to regard a monograph as a work which includes a review of the literature will be disappointed at the paucity of the bibliography here supplied. The references are quite inadequate for a work of such importance. It is difficult, for example, to understand how the classical work of Gull and Sutton can have been ignored, and perhaps still more remarkable is the omission of all reference by the authors to the work of their distinguished compatriot, A. M. Fishberg.

The last decade has seen a notable revival in scientific interest in medical diseases of the kidney, and this monograph is a worthy contribution to this movement.

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### Radiations from Radioactive Substances.

By Sir ERNEST RUTHERFORD, O.M., D.Sc., Ph.D., LL.D., F.R.S., Nobel Laureate, Cavendish Professor of Experimental Physics in the University of Cambridge; JAMES CHADWICK, Ph.D., F.R.S., Fellow of Gonville and Caius College, Cambridge; and C. D. ELLIS, Ph.D., F.R.S., Fellow of Trinity College, Cambridge. London: Cambridge University Press. Pp. 588. 25*s*.

THE students who were brought up on Rutherford's "Radioactivity," published in 1904, were ready and waiting for his next volume, entitled "Radioactive Substances and their Radiations," which appeared in 1912. This book was soon out of print, and once again an eager crowd, ever increasing in numbers, awaited the publication of another standard work of reference by the author. They had long to wait, but the book now issued is worth waiting for. Praise would be impertinence; one does not praise a revelation of a new world of knowledge. Some idea of the extent of the growth in the subject of radioactivity is gained from the title, about which Lord Rutherford says in his preface: "For these reasons, I have thought it desirable to confine this new work mainly to an account of the radiations from active matter and their application to physical problems. The way in which the long series of radioactive transformations has been unravelled is only referred to in an incidental manner."

This book will be accounted at once as the standard work of reference on the subject for English readers.

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### John Chalmers DaCosta.

***Selections from the Papers and Speeches of John Chalmers DaCosta, M.D., LL.D.*** By SAMUEL D. GROSS, Professor of Surgery at the Jefferson Medical College, Philadelphia. London: W. B. Saunders Co., Ltd. Pp. 440. 30*s*.

IN this large book, but not too large for the range of its subjects, Dr. DaCosta puts together a series of papers contributed to American medical journals, forming the substance of addresses delivered to American medical societies and associations. Philadelphia looms large in the chapters, for they include a character sketch of the famous Prof. Gross, the founder of the professorial chair which the author fills; the stories of the old Blockley and Jefferson hospitals and the oration delivered at the jubilee meeting of the Philadelphia County Medical Society; biographical notes on William Williams Keen, "the most notable figure in the Jefferson Medical College"; and an example of a Samuel Gross oration. Of chapters of more general interest one describes medical Paris during the reign of Louis Philippe; another records the performances of Napoleon's famous military surgeon Baron Larrey; another summarises the virtues and failings of Samuel Pepys fairly; and another gives a detailed description of Dickens's doctors in which the great novelist is found to have treated the medical profession unfairly, but in which, perhaps, too much stress is laid upon the presentations of obvious caricatures. The book, which is dedicated to Prof. Harvey Cushing, should interest many readers.

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### Grosse Biologen.

*Eine Geschichte der Biologie und ihrer Erforscher.* By Prof. ERNST ALMQUIST. Munich: J. F. Lehmann. 1931. Pp. 143. RM.8.

Prof. Ernst Almquist, of Stockholm, has written a short history of biology in the form of 23 biographical sketches of men who were curious enough to inquire into its secrets. The book is a sequel to Prof. Philipp Lenard's popular "Grosse Naturforscher," a series of scientific biographies which began with Pythagoras and Euclid, going on through Galileo, Kepler, Descartes to Faraday, Helmholtz, Bunsen, and Crookes. Almquist begins with William Harvey and goes on through Linnaeus, Mendel, Virchow, Pasteur, and Koch to Darwin, De Vries, and Carl von Nägeli, then returning rather surprisingly to Aristotle, Francis Bacon, and John Stuart Mill. He devotes a chapter to the mistaken orientation of present-day biology on which he holds strong views. He finds progress chiefly among those who have done experimental work and have not allowed mere theorising to carry them beyond what can be proven. The book is embellished with admirable photographs and is a stimulating contribution to biologic thought.

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## REPORTS AND ANALYSES

### "ORYO" CRISPBREAD.

(MADE IN SWEDEN.)

ORYO, LTD., 91/3 BISHOPSGATE, E.C.2.

THE package contained 8·7 oz. of thin biscuit-like material, the separate pieces (26) measuring 4¾ in. by 2½ in. On analysis the following results were obtained:—

| | | |
|---|---|---|
| Moisture | 6·66 | per cent. |
| Ash | 2·40 | ,, ,, |
| Fat | 1·65 | ,, ,, |
| Protein | 12·25 | ,, ,, |
| Crude fibre | 2·00 | ,, ,, |
| Digestible carbohydrates | 75·04 | ,, ,, |
| Calorie value (per lb.) | 1693 | |

These figures support the claim that the crispbread is prepared from whole grain rye. By reason of its crispness Oryo is easy to masticate, and this helps the digestive process; in addition it has a very agreeable flavour. As it is cut into slices ready for use, the handling of it before serving is reduced to a minimum. When consumed with butter or other fatty material Oryo constitutes an attractive food material.

THE LANCET.

*LONDON: SATURDAY, MAY 30, 1931.*

## EPIDEMIC JAUNDICE.

DURING the past few months fresh facts have been added to our knowledge of epidemic jaundice. It is evident that there are at least two epidemic diseases characterised by jaundice and by a number of other clinical symptoms in common. These two diseases are leptospiral jaundice and epidemic catarrhal jaundice, or, as Rolleston and McNee prefer to call it, common infective hepatic jaundice. Both diseases appear to be world-wide in their distribution and by clinical means alone their differentiation is by no means easy. It is therefore important that every epidemic should be investigated both clinically and bacteriologically. Such an exhaustive investigation has recently been carried out by J. Taylor and A. N. Goyle [1] on the causation and epidemiology of the jaundice that occurs in the Andamans. Jaundice has been rife in these islands for a very considerable time, and during the last 40 years has been studied by numerous workers. F. A. Barker, in 1926, was the first to demonstrate the presence of leptospira, while two years later, in our own columns, H. C. Brown showed that antibodies to leptospira were present in the blood-serum of jaundiced patients, bringing forward evidence that in the sera examined there were antibodies which, while quite distinct from those produced by the London human and rat strains, were allied to certain strains of leptospira from Sumatra. As a method of diagnosis, Taylor and Goyle find that blood culture is of great value provided it is carried out between the third and sixth day of illness. The serological relationships of the 28 strains of leptospira isolated were also investigated with the result that there appear to be two distinct serological groups. In studying the relationship of *L. icterohæmorrhagiæ* to the Akiyami A strain, K. Yang and M. Theiler [2] have lately raised the question whether it is legitimate to recognise a new strain simply because there is a demonstrable quantitative difference in the potency of the immune serum as manifested for example by the agglutination test. The findings of Taylor and Goyle are, however, so definite that they appear to warrant the serological grouping of the Andaman strains. In discussing the differential diagnosis of leptospiral jaundice, Taylor and Goyle say that in catarrhal jaundice the general pains, albuminuria, conjunctival congestion, and tendency to hæmorrhage are absent. To this it is difficult to agree, for some or all of these symptoms may be encountered in cases of epidemic catarrhal jaundice.

Epidemic non-leptospiral jaundice has also recently received considerable attention both in this country and abroad. One such outbreak, involving the pupils of three schools, was recorded in our issue of March 28th by J. A. Glover and Joyce Wilson, while another has recently been investigated in Surrey by G. M. Findlay, J. L. Dunlop, and H. C. Brown.[3] In its epidemiological and clinical features this Surrey outbreak was very similar to those recorded by W. G. Booth and C. C. Okell [4] in 1928 from Surrey, by M. T. Morgan and Brown [5] in the same year from Northamptonshire, and by W. N. Pickles [6] in 1930 from Yorkshire. The incubation period was found to be a long one and varied from three to five weeks. In leptospiral jaundice, on the other hand, according to Taylor and Goyle, and others, the incubation period is from six to eight days, while V. de Lavergne and Robert-Lévy [7] record an incubation period of about five days when the leptospira gain entrance by the mouth and 15 days when they pass through an injured skin surface. An examination of the differential leucocyte count may also be of service in distinguishing leptospiral and epidemic catarrhal jaundice. Taylor and Goyle, as the result of a very large series of blood examinations, come to the conclusion that the most striking feature of the differential count is the relative increase in the number of polymorphonuclear leucocytes. In epidemic catarrhal jaundice, on the other hand, according to Findlay, Dunlop, and Brown, an increase in the polymorphonuclear leucocytes is present, if at all, only during the first few days of the disease. Instead there is a decrease in the number of polymorphonuclear leucocytes with a corresponding increase in the number of lymphocytes, large mononuclears, and transitional cells. In America, C. M. Jones and G. R. Minot (1923) and E. Thewlis and W. S. Middleton (1925) have recorded similar blood changes in epidemic catarrhal jaundice. In the course of the investigation of the Surrey epidemic numerous unsuccessful attempts were made to transmit the disease to guinea-pigs, and to determine the presence of immune bodies to leptospira in the serum. Efforts to infect monkeys (*Macacus rhesus*) either by the inoculation of blood or by spraying with washings from the nasopharynx of patients in the pre-icteric stage of catarrhal jaundice were also unsuccessful, as were attempts to transmit the disease to rabbits, rats, and mice. The failure to infect Indian monkeys with epidemic catarrhal jaundice occurring in this country is in agreement with the findings of Beeuwkes, Walcott, and Kumm,[8] who were also unable to infect monkeys with the form of jaundice

[1] Ind. Med. Res. Memoirs, 1931, No. 20.
[2] Amer. Jour. Trop. Med., 1930, x., 407.
[3] Trans. Roy. Soc. Trop. Med. and Hyg., 1931, xxv., 1.
[4] Public Health, 1928, xli., 237.
[5] Min. of Health Rep. on Pub. Health and Med. Subjects, No. 42, London, 1928.
[6] Brit. Med. Jour., 1930, i., 944.
[7] Presse Méd., 1931, 651.
[8] Trans. Roy. Soc. Trop. Med. and Hyg., 1931, xxiv., 429.

which has recently occurred in epidemic form in West Africa.

Findlay, Dunlop, and Brown also discuss the relationship of epidemic catarrhal jaundice to acute yellow atrophy of the liver, or, as it is preferably called, acute necrosis of the liver. In this country there has been but one recorded fatal case of epidemic catarrhal jaundice—that reported by Morgan and Brown. Abroad, however, and more especially in Sweden, acute yellow atrophy has occurred almost in epidemic form as a sequela of epidemic catarrhal jaundice. In 1927 acute yellow atrophy of the liver was responsible for 84 deaths in Sweden, 42 cases being met with in Stockholm alone. As H. Bergstrand [9] points out, the initial symptoms of acute yellow atrophy of the liver are identical with those of catarrhal jaundice; then, quite suddenly, there appear the well-known signs of liver insufficiency. The reason why epidemic catarrhal jaundice should be so benign in this country yet on occasions so malignant abroad is at present unknown. Possibly the acute necrosis of the liver is due to some secondary infection which acts on an organ primarily damaged by the epidemic catarrhal jaundice. In certain cases of acute yellow atrophy of the liver Bergstrand, for example, has obtained *Streptococcus viridans* in pure culture from the duodenum. While there is now ample evidence that leptospira are ætiologically responsible for one form of infectious jaundice, there is as yet no indication of the causal agent of epidemic catarrhal jaundice. Failure to isolate any bacterium of ætiological significance does not, of course, rule out a bacterial origin. It does, however, suggest the possibility that epidemic catarrhal jaundice may have to be added to the ever-growing number of diseases caused by ultra-microscopic viruses.

## CANCER AND RACE.

ONE of the legends surrounding the cancer problem is that Jews are relatively immune from cancer. Another is that they are particularly susceptible to cancer. Either of these two assertions, if substantiated, would be of considerable general importance, because it would indicate the existence of a factor of racial susceptibility in the ætiology of cancer. The Jews, as ROGERS WILLIAMS has pointed out, are particularly suitable for the investigation of such a problem because, although they have acquired the general habits of the non-Jewish populations among which they live and are subjected to the same general environment, they have maintained themselves racially pure. Dr. SORSBY has attacked this problem by comparing [10] the recorded cancer mortality in various Jewish communities—London, Amsterdam, Vienna, Budapest, Warsaw, Lodz, and Leningrad—with each other and with that of the non-Jewish populations in these different cities. In collecting this material considerable difficulties had to be overcome in order to exclude statistical fallacies which have been clearly recognised by the author. As a result of these investigations the conclusion is reached that the total recorded mortality from cancer varies in different Jewish communities tending to approach that of the non-Jews of each particular city, so that there is no evidence of a racial factor so far as the general mortality from cancer is concerned.

There are, however, striking differences in the organ incidence of cancer between Jews and non-Jews. Thus in all communities investigated the incidence of cancer of the uterus is much lower among Jewish women than among non-Jewish women, the incidence for Jewish women varying from about one-half to one-third of the incidence in their non-Jewish neighbours. The same is true for cancer of the penis among men, not one case of cancer of the penis having been found in the 2252 male cancer deaths recorded among the Jews of London and Vienna, although from the incidence among non-Jews 12 cases were expected to have occurred. A higher organ incidence among Jews was found for the lower part of the gastro-intestinal tract and for the ovaries. These differences in the organ incidence are subjected to a detailed discussion, and the conclusion is reached that they are not due to racial factors but to environmental factors. Thus the immunity from cancer of the penis is attributed to circumcision, while the relative freedom from cancer of the uterus is explained as being the result of the greater sexual hygiene imposed upon Jews by religious prescriptions. This latter explanation seems however hardly consistent with the author's own data. For while it is true that for each community the incidence of cancer of the uterus is always lower for Jewish women than for their non-Jewish neighbours, a comparison of this incidence among the different communities shows extremely wide variations both for Jewish and for non-Jewish women. Thus the Jewish women of Budapest suffer from cancer of the uterus as frequently as the non-Jewish women of Vienna and Warsaw, and even more frequently than the non-Jewish women of Amsterdam. It should be remembered that the recent very detailed investigations carried out by an international statistical committee under the auspices of the Health Organisation of the League of Nations on a closely related question—namely, the notable differences in the incidence of cancer of the breast and uterus in Dutch and in English women—has failed to find any environmental factors which could reasonably be made responsible. As regards the higher incidence of cancer of the intestinal tract among Jews Dr. SORSBY frankly admits that he is unable to offer an explanation.

These differences in the organ incidence of cancer, which may frequently be found when different groups of populations are compared, are indeed very puzzling. What is even more puzzling is the fact, to which attention has been drawn in the recent annual reports of the Imperial Cancer

[9] Über die akute und chronische Gelbe Leber-atrophie. Leipzig, 1930.

[10] Cancer and Race. A Study of the Incidence of Cancer Among Jews. By Maurice Sorsby, M.D. London: John Bale, Sons, and Danielsson. 1931. Pp. 120. 7s. 6d.

Research Fund, that the groups of populations in which they occur may nevertheless have the same total incidence of cancer. The most striking example is offered by a comparison of the cancer incidence in men and women in this and certain other countries, a comparison which with an obviously different organ incidence presents an approximately equal total incidence from cancer. Dr. SORSBY's work presents another example of this phenomenon, for in most of the Jewish communities investigated by him men and women suffered in about equal numbers from cancer. Dr. SORSBY offers no comment upon this curious fact. But unless one is satisfied to pass it off as a mere chance effect, which is a priori improbable, this equality in the total incidence of cancer requires an explanation as much as do differences in the organ incidence of cancer. The subject has been discussed in a recent paper by Dr. W. CRAMER[11] in which the view is expressed that the incidence of cancer in man is determined not only by the one extrinsic factor, namely, chronic irritation, but also by an intrinsic factor, namely, the general susceptibility to the development of cancer of the individuals whose organs are being subjected to the various forms of chronic irritation.

## ROYAL SOCIETY CONVERSAZIONE.

MANY people who went to the conversazione given by the Royal Society on May 20th probably put the occasion to its proper use and spent most of their time talking to one another. But the exhibits were as well staged and as entertaining as usual, and there was a good deal of medical and biological interest. Dr. J. S. Owens had a further improved model of his automatic apparatus for measuring smoke impurity in the air in which the motive power is supplied by a large weight; it can therefore be used in places where no other source of power is available. We hope that it will be of use in making his methods and results more widely known until we are all ashamed to burn smoky fuel in our houses; his records through the 24 hours conclusively condemn the domestic fire in its present state. Dr. W. B. Brierley showed a film illustrating the formation of the cell inclusions in plants affected with virus diseases, worked out by himself and his colleagues at Rothamsted. The first sign of the inclusions is the appearance of small proteid particles in the streaming cytoplasm of the infected cells. These particles grow larger and fuse into a few big aggregates, and ultimately most of them are contained in a single large mass which finally tends to break down with the appearance of a number of proteid crystals. Cell inclusions, some in the cytoplasm, some within the nucleus, occur in most (but not all) virus diseases in animals and plants; their appearance is often highly characteristic and may be useful for diagnostic purposes as in, e.g., the "Negri bodies" of rabies. Evidence has recently been obtained by Prof. J. C. G. Ledingham and others that in animals these inclusions are made up of a number of minute particles which may not unreasonably be supposed to be the individual elements of the virus itself. The Rothamsted observations suggest that the particles are the result rather than the cause of the disease, though they are not wholly incompatible with the other interpretation, and the bodies in plants may possibly be of a different kind from those found in animal infections. Mr. F. W. Sansome, of the John Innes Institution, had some tomato plants in which a proportion of the adventitious shoots representing regeneration after amputation contained twice the normal number of chromosomes; some of these shoots, amputated in turn, would double their chromosome number again—changes associated with an alteration in the shape of the leaves but leaving the plant otherwise much as before; appearances are due to quality rather than quantity of nuclear material. Animal growth and differentiation was illustrated by a particularly clear demonstration by Mr. C. H. Waddington, of the Strangeways Laboratory. In chick embryos grown in tissue cultures a developing primitive streak, transplanted to another part of the embryo, can induce the formation of a neural plate in ectoderm which would not normally form such a structure; isolated pieces of primitive streak also have this inductive capacity, and duck tissue can act similarly on a chicken embryo. And such are the capacities of growing tissues that the rest of the embryo can regenerate a primitive streak that has been removed. The late Dr. Strangeways was evidently right in thinking that pathologists would learn much from the methods of tissue culture. Prof. Elliot Smith showed the skulls of the Peking man and the Taungs ape, and the Natural History Museum had a case of models of some of the monstrous animals that live in the depths of the sea and pass as fishes. Useful methods for staining bones and cartilage in toto were illustrated by Mr. H. W. Parker and Dr. G. R. de Beer. Rather striking was the large proportion of exhibits which came from research institutes and groups of investigators; the teaching school and the individual worker are progressively becoming less prominent.

[11] Cancer. Festschrift for James Ewing. London: J. B. Lippincott Company. 1931. Pp. 484. 45s.

BIRMINGHAM HOSPITALS.—Sir Charles Hyde, president of Queen's Hospital, has inaugurated two more beds in that institution, each of the endowed value of £1250, presented by the students of Birmingham University from the proceeds of their last carnival day. Since 1921 the students have contributed £20,698 to the hospital and they have set themselves the task of endowing a whole ward.—Last year 1060 in-patients were admitted to the wards of the Birmingham and Midland Ear and Throat Hospital, a reduction of 468, but their average stay was longer—12·29 as against 10 days. The reduction in numbers is accounted for by the necessity of closing the wards on several occasions on account of infectious cases. There were 9078 new out-patients who made 40,042 attendances. The bulk of the patients of both categories were admitted through the contributory scheme.—The reception hall of the out-patients' department at the Children's Hospital, Birmingham, has been decorated by four students of the Birmingham Art School, under the superintendence of Mr. Collins, the principal. The work, which has taken more than two years, consists of a series of panels, covering the walls of the hall to a height of several feet, depicting the story of Noah's ark.

# ANNOTATIONS

## A MODERN LINER.

THE new Bibby liner *Worcestershire* is a ship of 11,000 tons register (19,000 displacement), 500 feet long, with two Diesel-Sulzer engines, which give her some 340 miles for her daily run, and should take her to Rangoon in about 23 cruising days. She carries 290 passengers (all first class) on four decks amidships, and our representative who visited her at Tilbury found that the old standards of comfort have been far surpassed. On the main deck, specially ventilated by thermotank punkah louvres and by ports, are cabins for 100, and the dining saloon which has, in addition, overhead fans for comfort. On this deck is the doctor's cabin and the surgery. Above it is the main promenade deck, where are the barber's shop and the children's playroom, fitted with see-saw, rocking-horse, and so forth. On the upper promenade deck are, from behind forward, besides the cabins, the veranda café, the smoking-room, and the lounge, while on the upper deck is the drawing-room. On each of the three upper levels are wide stretches of deck, shaded, and it is hoped cool, plenty of room being reserved for games and exercise. The cabins are comfortable; each has a porthole, also a bed, wardrobe, electric fan, fixed basin, and ventilator. The officers are lodged on the navigating bridge, one deck higher. Down below are the usual offices, bakery (coke-fired oven, electric kneader, and ice-cream mixer), cold pantry (electric refrigerator), and the galley, which cooks by coal, oil, steam, or electricity, as suits best the work of the moment. Right aft is the steam laundry, with electric irons for passengers to use. Also at this end is the hospital, and on the decks below are the galleys and other offices for the native crew—mostly from Chittagong. This accommodation is good, and far in advance of the 72 cubic feet per man required by law; they have also good baths and hot water readily obtainable alongside, and their latrines are separated by light bulkheads into cells for individuals. Forward are the European crew, five quartermasters, two deck boys, and 80 stewards. All have iron frame beds with spring bottoms, on iron supports, good-shaped mattresses (the "donkey's breakfast" of old has passed away) and bedding, all provided by the company. There are the usual ventilators and port-holes (windscoops also for these), electric fans, radiators, lockers for clothes, and a table and stools, all of which help to make the stewards comfortable when off duty. There are also hot and cold baths for them. The touchstone of the sanitary achievement of a ship is the state of her water-closets, but these were all locked up, the ship being in dock. One key was found of a w.c. for crew; it was a cell of good size, painted white, and there was a closet pedestal with a good flush. It was quite satisfactory, and an enormous improvement on pre-war construction. The others on board were said to be similar; they were also described as supplied with latrine paper, but none was seen here in dock. An unexpected sight was a row of carbonic acid cylinders, to be used for extinguishing unwanted fires.* For protection against damage by grounding, the ship has a double bottom extending all her length. The modern care of dock labourers by the Home Office factory inspection was evident in the long straight ladder-ways to the lower hold (recently ordered), from which cargo was being discharged. This care for these men caused some sarcastic comment from seamen, who felt they were not equally protected; nor in their youth and strength did they need to be. But it is right and much good has been done.

The ships of this line gave satisfaction as hospital ships in the war, and three days before our representative's visit 4000 men, women, and children had been on board in a rally for the good of local hospitals. Yet everything had been put quickly right, and the ship was not only a sanitary satisfaction, but, as every seaman desires, she looked a picture—a credit to her officers and crew.

* It is worth consideration whether these cylinders can safely be kept in the forward alleyway, just outside several crew spaces. In a collision one or more might perhaps be broken.

## CRIMINAL LUNATICS.

THE latest figures concerning criminal lunacy do not encourage complacency. The Criminal Statistics for 1929 (the latest issued) show that at the end of that year there were 910 criminal lunatics under detention in England and Wales. No fewer than 414 of these had been charged with murder, 140 with attempted murder, 21 with manslaughter, 55 with felonious wounding, and 46 with the misdemeanour of malicious wounding. The danger to public safety is self-evident. Another 28 were charged with rape, indecent assaults on females, or the defilement of young girls. The mere danger to property is illustrated by the total of 31 who were charged with arson. In the face of these figures, the public may begin to realise that there is reason for abating the persecution of medical practitioners who perform the thankless task of certifying the insane. The Mental Treatment Act has raised hopes of better protection for the public as well as of better treatment for the mentally afflicted. Out of 145 criminal lunatics who were received into asylums during the year under review, 45 were "King's Pleasure Lunatics," that is to say, 20 were found insane on arraignment and 25 (four-fifths of whom had been charged with murder) were found guilty of the act charged but insane at the moment of committing it; 100 were certified insane after conviction. Does not this last-named figure suggest that the legal view of criminal responsibility is still too rigid? In how many of these 100 cases must there not have been, before the commission of the criminal act, an abnormality of mind obvious to the medical profession though invisible to the eyes of the law?

Some further information as to criminal lunatics appears in the annual reports of the Prisons Commissioners; the latest report for England appears to be that for 1928. The Medical Commissioner therein states that in addition to the totals of men and women certified as insane in local prisons or found insane by the courts, 1699 men and 504 women were remanded to prison for observation, reports being made later to the court upon their mental condition. It thus appears that there is adequate machinery for inquiry and report; the results indeed must be invaluable to the courts when disposing of the cases of accused persons. But perhaps it is not too optimistic to look for the day when these cases of mental instability will be observed and suitably treated before the patient comes in conflict with the criminal law. Though the Medical Commissioner's report (for 1928) had some interesting comments on

encephalitis lethargica and moral deterioration, the rest of the report of the Commissioners for England is not particularly informative as to criminal lunacy. The corresponding report for Scotland (available for the year 1929) gives rather fuller details, especially in respect of the type of insanity of each inmate admitted to the Department at Perth Prison, and in respect of the cost of maintenance.

## PLANS OF CAMPAIGN AGAINST MALARIA.

In the latest annual report of the Ross Institute Sir Malcolm Watson deals at length with the malaria policy of the Institute, and maintains that the proposals of the League of Nations Malaria Commission, as he believes to be advised for Europe, would result in leaving millions of malaria-stricken races in the tropics to struggle helplessly with the disease until they become strong and healthy. He characterises it as one of the most astounding propositions he has ever heard. It should not be forgotten that there are two lines of attack in the antimosquito campaign, antilarval and anti-imaginal. Sir Malcolm, with immense experience of their benefits, naturally lays stress on antilarval measures. The Commission has laid stress on anti-imaginal measures, being, it is clear, convinced that actual infection takes place nearly always in the house. Some of the grounds for this conclusion must be experiences such as that of Watson himself—namely, that to remove the dwelling to half a mile from anopheline breeding grounds, without altering the locality of the daily work of its inhabitants, gives practical immunity from malaria. But if a house can by its very cleanness, lightness, and airiness be made distasteful to the adult anopheles, the same end is attained as if it were placed at a distance from the site of pupal emergence of these imagines; and the possession of a home of this kind is rendered possible only by raising the human standard of life. That there are these two practical and supporting lines of approach to the antimosquito campaign few will question; to determine which is the more useful in particular circumstances seems to give the strongest support to the policy of the Ross Institute, which is one of research and experiment in field and laboratory, undertaken in close coöperation with sanitation, medicine, and industry. Apart from all those considerations of duty and humanity which must bring many subscriptions to the Institute, the sums of money received form, as Sir Patrick Manson is quoted as saying of their like, "an investment yielding a most liberal return to the country that makes them."

## THE GERSON DIET FOR DERMATOSES.

The results recently recorded[1] do not support the more enthusiastic views of previous writers on the Gerson-Sauerbruch-Hermannsdorfer salt-free diet. The cases included four of lupus vulgaris, one of lupus verrucosus, two of varicose leg ulcer, two of chronic ulcer, one of seborrhœic dermatitis, and one of neurodermatitis. In none of the tuberculous cases was a cure achieved, although there was definite involution and inhibition of extension. The two leg ulcers remained in statu quo after four months of the treatment. In the neuroderma case the usual eosinophilia fell from 10 per cent. to 4 per cent., although all previous attempts to influence it, by X rays and other means, had failed. The pruritus was also relieved but relapsed three weeks later. A similar incomplete result was achieved in the case of seborrhœic dermatitis, but both the cases of chronic eczema were discharged cured after two months' dieting—one of them having previously resisted almost every conceivable treatment, as an in-patient for 11 months. Some interesting investigations on the blood calcium, sodium chloride, sugar, and alkali reserve of the blood, and the pH of the urine were carried out at the same time as the salt-free dieting. On the whole there was a slight rise in the calcium content, no change in the sodium chloride, and none that was at all noteworthy in the alkali reserve. The pH of the urine showed a definite movement to the acid side, although no such tendency of the whole organism as is posited by Hermannsdorfer could be demonstrated. In their conclusions the authors say that the Gerson salt-free diet is of considerable value in cases of tuberculosis cutis, and might be found even more helpful when combined with actinotherapy and other methods as is done by Jesionek and others. The main purpose of their investigation was to ascertain the constitutional effects, if any, on the organism as a whole, and in particular how the general change in environment affects the growth and persistence of the tubercle bacillus. They think that further progress awaits elucidation of the essential mechanism of the treatment—which may have some relation to the chloride and water content of the skin itself.

[1] Schlammadinger, J., and Szép, E.: Med. Klinik, April 2nd, p. 508.

## THE LEBANON HOSPITAL.

This year sees the thirtieth anniversary of the Lebanon Hospital for mental diseases at Asfuriyeh, Beirut. Thirty years ago the state of the mentally afflicted in Syria was pitiable. Except for a collection of bare and wretched cells in Damascus, there was no provision for their care or treatment, and their fate was almost worse than that of the insane in this country in the Middle Ages. A Swiss missionary, Theophilus Waldmeier, decided in 1896 to retire from the Brummana Mission in order, at the age of 64, to set forth on a crusade to establish an asylum in Syria. He spent two years visiting asylums in England, Europe, and America, and in appealing to a wide public for funds. The hospital, which he opened in 1900, was an international venture. It began as an old farmhouse, amid a few sparse trees, with 15 beds, and untrained mountain girls as attendants. Now there are 219 beds, tended by capable nurses, amid groves of trees and gardens. The annual report[1] shows that during last year 163 patients were admitted, and there were 219 in residence on March 31st, 1931. During the year 48 patients were discharged relieved, 26 recovered, and 16 died. Even in Syria there is a large proportion of voluntary patients, and the hospital consulting-room serves as a valuable out-patient department. There is considerable overcrowding and many applications have to be refused, despite the addition last year of an upper storey to one of the women's pavilions and a new corridor of 11 single rooms for women. Open-air care and occupational therapy were practised at the Lebanon Hospital from the first. The patients are engaged in mattress-making, carpentry, gardening, laundry work, the olive oil soap industry—from the olive trees on the estate—and the making of leban, a form of sour milk. In the early days little or

[1] Obtainable from the Secretary, 55, Wellington-road, London, N.W. 8.

nothing was paid by or for the patients, but now the French Government pay a small capitation fee for the very poor, while the private patients give according to their means. The hospital is a teaching centre; its medical superintendent is professor of psychiatry at the American University at Beirut and holds weekly clinical classes at the hospital. Senior students spend two months as resident assistants and help in the laboratory work. Nurses are also trained here. The London general committee is appealing for financial help for the necessary extension of accommodation and for an endowment fund, and we hope these will soon be forthcoming.

## THROMBOSIS OF THE ANTERIOR SPINAL ARTERY.

Dr. A. M. Ornsteen,[1] of Philadelphia, who reports two cases of his own, maintains that thrombosis of the anterior spinal artery is commoner than is generally supposed. Acute spinal paralysis may take place without violence to the spinal column, and apart from hæmatomyelia, acute transverse myelitis or vertebral disease. Spinal strain is usually the exciting factor in the thrombosis, but the underlying factor is generally syphilitic disease of the blood-vessels. The clinical manifestations vary according to the extent and level of the occlusion. When the upper portions of the anterior spinal arteries are occluded a bilateral spastic motor syndrome results, giving rise to paralysis of the upper and lower limbs with loss of deep sensibility. Occlusion of the second portion of the anterior spinal artery produces symptoms of amyotrophic lateral sclerosis with dissociation of sensation of the spinal type more or less irregular in its distribution. In obliteration of smaller branches of the anterior spinal artery the symptoms of paraplegia are less marked and do not involve all parts of the extremities. Early and adequate antisyphilitic treatment is advisable in all cases. Ornsteen's first patient was a man aged 54 in whom disturbance of deep sensibility in addition to bilateral pyramidal tract involvement indicated a lesion of the lower part of the medulla oblongata, while atrophy of the shoulder girdle and segmental dissociation of sensation in the right forearm showed that the occlusion of the anterior spinal artery extended down into the cervical region. In the second case, that of a woman aged 24, the symptoms suggested occlusion of the anterior spinal artery in the cervical region. The issue is not recorded in either case.

## THE ZÜND-BURGUET TREATMENT OF DEAFNESS.

A FRANK report of his experiences in the treatment of deafness by the electrophonoïde method of Zünd-Burguet has been published by Mr. R. Graham Brown, of Brisbane.[2] After a visit to Mr. Zünd-Burguet in Paris in 1926, he obtained the apparatus and began to use it with enthusiasm, but after carefully observing 40 consecutive cases, he was satisfied that the benefits were very few and slight. He remarks that in deaf people we have not only the deafness and noises in the head to contend with, but also that "fullness in the head" which is a frequent symptom. Most of his women patients believed that this symptom was improved by the treatment, but not so the men; and he observes that deaf female patients are very easily "buoyed up" by almost any form of treatment, and their responses to tests must be carefully scrutinised. In only a few cases was tinnitus lessened to a degree which made the treatment worth while. In the 40 consecutive cases 14 patients were males and 26 females; only three of the males reported any improvement in hearing, two of these relapsed to the previous condition, and the third showed no improvement to tests. Of the 26 females, 12 reported improvement, four of these relapsed, four of the remainder showed no objective improvements on testing; in one the improvement was very slight, and in one a second course gave no result; of the remaining two patients one reported a slight, and the other a very great improvement in hearing. Mr. Graham Brown has given a summary of these 40 cases in tabular form, and has included in the details the presence or absence of tinnitus and of the sensation of fullness; the unsatisfactory nature of the results does not seem to be due to insufficient treatment, for several of the patients underwent very prolonged courses. Negative results, such as these, are not often published, but are useful in assessing the effect of any method of treatment.

[1] Amer. Jour. Med. Sci., May, 1931, p. 654.
[2] Med. Jour. of Australia, March 28th, p. 375.

## GWATHMEY ANÆSTHESIA IN LABOUR.

THE method devised by Gwathmey for procuring painless childbirth has not, we believe, been tried to any great extent in Great Britain. It may be that practitioners shy at the numerous hypodermic and intramuscular injections, in addition to those made per rectum, or it may be that they have been convinced that the claim for "synergism" between morphia and magnesium sulphate has been convincingly disproved by Gwathmey's own countrymen. At any rate, the method has been so little reported on here that the paper[1] by O'Donel Browne will be read with interest. Although he deals with only 41 cases, these have been carefully studied at the Rotunda Hospital, and therefore the conclusions deserve respect. The procedure consisted in: (1) placing the patient in a quiet room and plugging the ears with cotton-wool; (2) when pains occurred at two- to three-minute intervals a soap-and-water enema was given, morphia gr. ¼ hypodermically, and 2 c.cm. of 50 per cent. magnesium sulphate intramuscularly; (3) 20 minutes later a second intramuscular injection of the same quantity of magnesium sulphate was given. Usually two or three hours' relief from pain followed. When this began to wear off the patient was placed in the left lateral position, and the anal region was liberally smeared with vaseline. A small rectal tube containing one ounce of warm olive oil was passed about six inches up the bowel. A bottle containing ether 2½ oz., quinine alkaloid grs. 20, absolute alcohol ℥ xl., and olive oil ℥iii., was warmed in lukewarm water and its contents were allowed to flow very slowly down the rectal tube. Finally, one ounce of olive oil alone was run in. The process took about 20 minutes, after which the tube was withdrawn and a pad of cotton-wool applied to the anus. Introduction of the rectal anæsthetic is made between pains, and above the presenting part. On the average two of these rectal instillations were needed, the time between them being five hours. Browne believes that the magnesium sulphate prolongs the relief given by the morphia without increasing its toxic effect. The bowel was washed out at the end of labour. The average duration of labour, from the

[1] Irish Jour. of Med. Sci., April, 1931.

time when the cervix was two to three fingers' dilated, was 17 hours in primiparæ and six hours in multiparæ. Ether was eliminated from the child's lungs. There was in no case any need for resuscitation, and delay in the second stage was not abnormal. As regards alleviation of pain, 21 patients had no recollection of any pain after the beginning of treatment, 13 had marked relief, 6 had moderate relief, and only 1 woman was quite conscious of her labour.

## CENTRAL BUREAU OF HOSPITAL INFORMATION.

AN event of importance to all those interested in hospitals is the merging into a Central Bureau of the corresponding organisations of the Incorporated Association of Hospital Officers, the British Hospitals Association, and the Joint Council of the Order of Saint John of Jerusalem and the British Red Cross Society. In the new Bureau all the information previously collected and issued by these bodies is now pooled. The chief activity of the past year has been the preparation of the first edition of the Hospitals Year Book, which retains everything of general interest that previously appeared in "Burdett's Hospitals and Charities." The work has been heavy, but the result will prove to be worth the effort. The Year Book is appearing in two main sections: a report giving particulars of the work done and of finances and kindred matters; and a directory of institutions, with addresses, names of chief officials, and other particulars. In addition to hospitals, dispensaries, and convalescent homes, the Year Book enumerates nursing institutions, homes for the mentally and physically defective, medical universities, and administrative and collecting societies. The publication price has been fixed at 15*s*., but hospitals and kindred institutions may obtain copies for 10*s*. if they order them direct from the publishers.

In addition to the Year Book, the Bureau publishes memoranda on topics which concern hospitals. During 1930 these publications covered such subjects as outside laundry work for larger hospitals, rubber flooring, working arrangements of X ray departments in hospitals of 50–100 beds, and the cost of building of hospitals recently constructed. Many other memoranda apply to particular districts or groups of hospitals. The advice and assistance which may be obtained from the Bureau is being sought more frequently by boards of management of voluntary hospitals, particularly in connexion with the selection of sites and the preparation of plans for new buildings, or with investigation into the costs of administration. In the course of this work the director has visited hospitals in various parts of the country and the Bureau has prepared reports. He has also visited several towns to discuss local problems with the committees of hospitals, or to address public meetings on behalf of local institutions. The Bureau has also assisted, as in previous years, in the distribution of money raised for a group of hospitals. The list of the Bureau's activities is published in the eleventh report of the Joint Council[1]; it covers more than a full page and embraces topics of amazing variety. Its aims (summarised), in addition to publishing the Year Book, are to collect data concerning all matters of administrative interest; to make inquiries for those responsible for guiding hospital policy; to establish a library of hospital literature, and to act as a clearing house of information. Its services are available without further fee to all hospitals which are members of the British Hospitals Association. An organisation of this kind grows in usefulness in proportion to the use that is made of it, and hospitals can best serve themselves and each other by taking the Bureau into their fullest confidence.

[1] 12, Grosvenor-crescent, London, S.W.1.

## MINERS' NYSTAGMUS.

THERE are two schools of thought on miners' nystagmus, one looking on it as a local affection of the eyes due to long hours of work in darkness, while the other regards it as a manifestation of psychoneurosis.[1] In a paper[2] by Mr. W. J. Roche, of Newport, Mon., both these points of view are recognised. As is clear from Prof. Collis's lectures, reported on p. 1220 of our present issue, the condition is of great economic importance. Mr. Roche says that between 1910 and 1929, with a diminution of the total number of men employed underground, the incidence of the disease increased threefold, despite many of the improvements as to lighting recommended by a committee of the Medical Research Council in 1922. The percentage of the underground workers receiving compensation in 1929 was 1·2, at a cost of £440,000. Yet this only represents a small proportion of the cases of coal-miners with oscillations of the eyes. In the underground workers examined by Mr. Roche they were present (though not necessarily constant) in 23 per cent. The great majority of these men are not incapacitated, and they only have to cease work if such symptoms as vertigo or photophobia supervene. The school which looks upon the oscillations of the eyes as the main feature of the disease is confronted by two puzzling facts—first, that whereas only a small percentage of underground workers are incapacitated, more than 20 per cent. of them show nystagmic oscillations, the great majority without any disabling symptoms; and secondly, that since the general substitution of the one-candle power electric lamp for the old hand lamp the number of men disabled by the disease has not only not diminished but actually increased. In spite of this Mr. Roche believes that the main cause of the condition is defective lighting, and he explains the last-mentioned anomaly by saying that the electric light with clear glass is dazzling, and causes disturbing after-images. The ideal light for mines is the cap lamp worn on the miners' head, but it is heavy and the men do not like it. As a compromise he advocates a four candle-power electric light with frosted glass. He himself, on taking on hewer's work as an experiment, found this much more effective and less irritating than the one candle-power clear glass lamp.

[1] See annotation in THE LANCET, May 2nd, p. 984.
[2] Brit. Jour. Ophthalmology, April, 1931, p. 211.

## MEMORIALS TO CLEMENS VON PIRQUET.

ON May 12th two impressive ceremonies took place in Vienna at the unveiling of memorials to the late Prof. Clemens von Pirquet, director of the University Kinderklinik, who died in 1929. In the Centralfriedhof, where his grave is among those granted by the city of Vienna to her most distinguished citizens, the memorial takes the form of a sculptured relief symbolic of his work for children, with a portrait in profile by Prof. Müllner. This was unveiled by Dr. Schober, the present Foreign Minister and late

Chancellor, and the speakers included Dr. Miklas, the President of the Republic, the American Minister, Dr. Grassberger, the Dean of the Medical Faculty of the Vienna University, and Dr. Tandler, on behalf of the city. They bore witness not only to Pirquet's achievements as scientist and physician, but to his great work for the Austrian children in the years following the late war. Speeches were also made by representatives from the Deutsche Gesellschaft für Kinderheilkunde, the Lister Institute, and the Medical Research Council of Great Britain and the Union International de Secours aux Enfants, while Prof. Nobel, formerly first Assistant at the Kinderklinik spoke on behalf of the pupils of the late professor. The unveiling in the garden of the Kinderklinik of a portrait bust of Pirquet, executed by Prof. Heu, took place in the afternoon and was of a more intimate character. Around the pedestal were grouped numerous laurel wreaths with inscriptions testifying to the international character of Pirquet's work. The ceremony was opened with singing by a choir of children from the tuberculosis sanatorium on the roof of the Klinik which Pirquet founded and in which he always took the deepest interest. After the bust had been unveiled by Prof. Arzt, the vice-dean of the Medical Faculty, there were speeches by Prof. Hamburger, the present director of the Kinderklinik, by Miss Harriette Chick, representing the Lister Institute and the Medical Research Council, with whose researches on nutrition in Vienna after the war Prof. Pirquet generously coöperated, by Dr. Noeggerath of Freiburg for the Deutsche Gesellschaft für Kinderheilkunde, and by Dr. R. Wagner on behalf of Pirquet's former staff at the Klinik and his pupils in general. The matrons of the Kinderklinik and of the Schwesternschule in Dresden spoke of what he did for the nursing profession in Austria and other parts of Europe.

## INDUSTRIAL HYGIENE AT THE FRANKFORT CONFERENCE.

THE German Industrial Hygiene Society has an extensive educational programme. No less than 36 brochures dealing with various occupational risks have been issued. Current advances in knowledge are communicated to meetings held in the large German towns to which medical men, scientific technical workers, and factory administrators are invited. Lectures are given to medical men and post-graduate classes held. Much effort is expended on the instruction of the workmen; in Germany they experience the same difficulty as we do in securing cleanliness, and getting the men to wear goggles and use respirators. Fortunately, the leaders of German trades-unions are among the most zealous collaborators of the Society. In a presidential address, delivered to the Section on Industrial Hygiene at the conference held by the Royal Institute of Public Health at Frankfort-on-Maine last week, Lord Leverhulme described a test which is claimed to be of considerable value in preventing accidents, and also in increasing output. Dr. Kurt Seesemann, of Mülheim (Ruhr), uses boards on which are printed in no order of sequence all the numbers between (say) 1 and 25, and 10 and 49. The examinee has to indicate the numbers in their natural sequence with a pointer, and to call them out while he is timed with a stop-watch. It is found possible in this way to discover persons whose perceptive faculties are exceptionally dull, and so to avoid employing them on work at which emergencies frequently arise. Dr. Seesemann claims that these tests also help in the wise distribution of labour in the factory, so that quick workers are not grouped with slow workers who would inevitably lower their standard of output; also that it is possible to discover workers who are particularly sensitive to monotony, and to employ them accordingly. At the same section Dr. E. W. Hope (Liverpool) also emphasised the part played by fatigue in proneness to accidents. One of the early signs of fatigue is a slight incoördination of the muscles, a condition likely to cause accidents. Investigators of the American Public Health Services found that when output rose above a certain level, involving industrial fatigue, the number of accidents showed an accelerated rate of increase—about fourfold, in fact—thus a 5 per cent. increase of output under these circumstances coincided with a 20 per cent. increase of accidents. Fatigue as a factor will be most operative at the end of the shift and day. It appears to affect women more than men; women working on a 12-hour day had two and a half times as many accidents as when working on a 10-hour day, but the men's accidents showed no difference.

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WE regret to record that Dr. William Dobinson Halliburton, F.R.S., emeritus professor of physiology in the University of London, died on May 21st at Exeter, at the age of 70.

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WE have also to announce the death of Sir Herbert Waterhouse, consulting surgeon to Charing Cross Hospital and for many years president of the Medical Defence Union. He was 67 years of age.

# THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. T. C. H. Neil is appointed to *Calypso*.

### ROYAL ARMY MEDICAL CORPS.

The undermentioned Capts. to be Majs.: J. W. Hyatt, J. R. S. Mackay, P. A. Stewart, E. P. N. Creagh, C. V. Macnamara, F. K. Escritt, and C. A. Whitfield.

#### ARMY RESERVE OF OFFICERS.

Lt.-Col. W. J. Waters, having attained the age-limit of liability to recall, ceases to belong to the Res. of Off.

#### TERRITORIAL ARMY.

Capt. J. M. Smeaton to be Maj.

The King has conferred the Territorial Decoration upon Lt.-Col. George Langrigg Leathes Lawson (retd.).

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NEW CHILDREN'S HOSPITAL AT LUTON.—On May 13th Sir Harold Wernher formally opened the enlarged building of the Children's Hospital, erected at a cost of £20,000 on a site at the rear of the old Children's Sick and Convalescent Home, which now becomes an administrative block. The new provision includes two wards, each of 20 beds, two single-bed wards, and an operating theatre. The wards were completed last autumn to the design of Mr. S. C. Parrott, but the formal opening has been postponed until the whole scheme, which includes the laying out of some beautiful gardens, was completed. Sir Walter Kent, president of the hospital, in welcoming the guests, made a spirited defence of the voluntary hospital principle and gave some account of its achievement in Luton, including the Bute Hospital paying ward scheme. The new hospital, it was pointed out, would require a larger annual income than before, and one of the visitors expressed his intention of leaving a legacy sufficient to endow two beds.

# SPECIAL ARTICLES

## THE WORLD CONFERENCE ON WORK FOR THE BLIND.

(BY A SPECIAL CORRESPONDENT.)

DURING the last few years there has been a remarkable development of the international side of the movement for the prevention and alleviation of blindness. An important step was taken by the publication in September, 1929, of a report by the League of Nations on the Welfare of the Blind in Various Countries, the report being based on the replies of 26 Governments to a questionaire issued by the League in response to a request by the British Government in 1927 that inquiries should be made to ascertain what was being done in various countries for the welfare of the blind. This report, though dealing primarily with the provision made for the welfare of persons who have become blind, contains much valuable information on the causes and prevention of blindness, and constitutes the most comprehensive description that has yet been given of the modern movement for the prevention and alleviation of blindness. The appearance of the report coincided with the foundation of the International Association for the Prevention of Blindness, which held its first session at Scheveningen, Holland, at the conclusion of the International Congress of Ophthalmology, which had taken place there and in Amsterdam in September, 1929. The second annual meeting of the board of governors of the Association was held in Brussels in October, 1930, when it was decided to set up national committees in the affiliated countries, and a British committee is now in process of formation.[1]

But the importance of preventive work must not be allowed to obscure the necessity of alleviating the lot of those who have become blind. Accurate statistics of the prevalence of blindness can hardly be said to exist, but it has been estimated that if blindness be defined in economic terms—e.g., as in the Blind Persons Act, 1920, which defines a blind person as one who is "so blind as to be unable to perform work for which eyesight is essential"—the number of blind persons in the world is probably not less than 6,000,000. The problems of alleviation therefore cover an extensive ground.

Blindness may be alleviated in many ways, but obviously the most effective is to provide the blind person with a useful and remunerative occupation. It was to explore the possibilities of this form of alleviation that the President of the United States in March, 1930, issued invitations to 50 countries, asking them to send delegates to a World Conference on Work for the Blind, to be held in New York City in April, 1931. The invitations were sent out at the request of the American Foundation for the Blind, the American Association of Institutes of the Blind, and the American Association of Workers for the Blind.

### OBJECTS OF THE CONFERENCE.

Briefly stated these were:—

(1) To promote international comity by bringing about more intimate personal acquaintance among leaders in work for the blind in the various countries.

(2) To give workers for the blind detailed information regarding activities in other countries which may suggest ways of improving the work at home.

(3) To establish means of effecting more rapid interchange of information regarding developments in work for the blind as to: (*a*) practical types of employment; (*b*) methods of instruction; (*c*) new appliances for overcoming the handicap of blindness; (*d*) prevention of blindness.

(4) To promote the coöperative use of embossed literature through interchange of books and sheet music among libraries, and exchange of periodicals, especially among countries speaking the same language. (NOTE.—This exchange of periodicals may be carried on both by publishers and by individual readers.)

(5) To enlist the coöperation of workers for the blind in various countries in the promotion of work of international interest, such as the establishment of uniform codes among countries speaking the same language, and furthering the movements to establish uniform embossed codes for music, classical languages, and higher mathematics.

Delegates from 34 countries, including ten from Great Britain, attended the conference, which, after a reception at the International House on April 13th, was held at the Pennsylvania Hotel, New York, from April 14th to 17th inclusive. On April 19th the foreign delegates were taken on a nine-day tour of visitation to representative agencies for the blind in Philadelphia, Washington, Pittsburgh, Cleveland, and Boston. In Washington the delegates had the honour of being received by the President and Mrs. Hoover, and the tour included a visit to Niagara Falls. The conference was re-convened on April 29th in New York, where the final session was held on the following day.

### WORK FOR THE BLIND.

At the present time the labours of those who seek to secure remunerative employment for the blind are rendered unusually difficult by reason of the prevailing industrial depression and consequent widely spread unemployment. Moreover, the development of modern industry has seriously affected some of the hand industries which have been regarded as specially suitable for the blind worker. In the field of basket-making and brush-making, for instance, the market is flooded with cheap machine-made articles. The rapid increase in the popularity of the gramophone and the radio has lessened the demand for teachers of the pianoforte, and also for pianoforte tuners, these callings being amongst the most lucrative in which blind persons without exceptional gifts can engage. The development of the "talkies" has similarly reduced the opportunities of blind musicians for finding employment in cinema theatres.

Notwithstanding these disadvantages, the conference afforded ample evidence that in many countries blind persons are to a surprising extent making good in a large variety of occupations. The employed blind may be ranged into four groups: first, those who have set up for themselves in business or professions; second, those who are employed side by side with sighted workers in factories and commercial undertakings; third, those employed in sheltered workshops; fourth, those working in their own homes under the supervision of an agency for the blind. The first group comprises persons of exceptional gifts who have profited by a sound general education and vocational training. For those who have aptitude for business a commercial enterprise normally offers the most promising opportunities for success, and, in America particularly, considerable numbers of blind persons are occupying business positions of responsibility and importance. The blind have made a successful entrance into various fields of professional activity. In Germany there are 41 blind lawyers, and 15 blind parish clergymen, and four important

[1] THE LANCET, March 14th, 1931, p. 605.

professorships are held by blind men. In France, special attention has been devoted to the training of the blind for the musical profession, and among the past pupils of the *Institution Nationale des Jeunes Aveugles de Paris* are several organists who have achieved distinguished success, such as Mr. Louis Vierne and Mr. André Marchal, who have recently made concert tours in the United States. In the provinces, eight graduates of the *Institution Nationale* are cathedral organists.

The main problem, however, is to find employment for persons without conspicuous ability—for the rank and file; and it is encouraging to note that experience steadily increases the number of occupations in which blind persons can work with success. In Germany, where the disablement law of 1920 requires that 2 per cent. of employed labour shall be disabled, promising results have been obtained from the employment of blind workers side by side with sighted workers. In this respect the Siemens-Schuckerts Company have set a notable example. The blind persons employed at the firm's factory near Berlin had had no previous technical training, and nearly all would have been classified as unemployable. They were put to simple operations and quickly became proficient. The firm state that 70 per cent. of their blind workers are of normal efficiency.

An interesting paper on the subject of finding employment for the blind in work for which eyesight was formerly considered essential was read by Captain E. A. Baker and Mr. J. F. Clark, of the Canadian National Institute for the Blind, who pointed out that the problem of securing a job for a blind person was essentially one of salesmanship. There is a good deal of disinclination among employers to offer jobs to blind persons, and "placement" officers must not only be well informed as to the capabilities of blind workers but must also possess "sales ability."

### THE PRINTING VISAGRAPH.

One of the most remarkable of the conference exhibits was the "printing visagraph," which was demonstrated by its inventor, Mr. Robert E. Naumburg, of Cambridge, Mass. The object of the visagraph is to enable blind persons to read printed matter that has not been issued in Braille or other embossed type. The instrument produces on a thin sheet of aluminium a magnified image of a printed page, and is intended for use by the blind person himself. It resembles a flat-top desk used in offices, and consists of two parts—the sending part and the receiving part. On the left half of the instrument—i.e., the sending part—the book which it is desired to read is pressed upward, right side up, against a flat glass plate. Above the book is the "lighthouse," which contains a lamp and a selenium, or photo-electric cell, sensitive to light. The "lighthouse" travels along the printed line from left to right, and as it travels the letters of the line are reproduced in embossed letters on the aluminium sheet on the right-hand half of the instrument—i.e., the receiving part—and can then be read as they appear on the sheet by the fingers of the blind reader.

### MISS HELEN KELLER.

To many of those attending the conference the most memorable event was the appearance at the opening meeting on April 13th of Miss Helen Keller, who gave an address of welcome, which was repeated sentence by sentence by Mrs. Macy. Miss Keller remained on the platform until the end of the meeting, and followed the speakers closely, the speeches being communicated to her by Mrs. Macy through the medium of the finger alphabet. Miss Keller, as is well known, has been blind and deaf since she was 18 months old, and her attainment to her present position, in spite of the stupendous disadvantages of total deprivation of sight and hearing, is surely one of the most outstanding triumphs of the human spirit. The presence at the opening meeting of this beautiful, accomplished, and radiantly happy lady was an event of good omen for the conference, and there were many who agreed with the remark of one of the delegates that it would be a good thing if the world's pessimistic writers could be collected into that room to look at Helen Keller.

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## MEDICINE AND THE LAW.

### Illegal Sale of Horticultural Poisons.

On May 19th successful prosecutions were undertaken in the Birmingham police-court by the Pharmaceutical Society against three companies and eight individuals in respect of the sale of poisonous substances for horticultural purposes. The preparations, apparently intended as an insecticide for fumigation of green-houses and similar uses, contained nicotine to an extent which made them a deadly poison. Section 4 of the Poisons and Pharmacy Act of 1908 allows persons who are not duly registered pharmaceutical chemists or chemists and druggists, to sell poisonous substances "to be used exclusively in agriculture or horticulture for the destruction of insects, fungi or bacteria, or as sheep dips or weed killers which are poisonous by reason of their containing arsenic, tobacco or the alkaloids of tobacco," provided that the seller has a licence from the local authority and that he complies with prescribed regulations. The Section further provides that such licensed seller is not to be exempt from other requirements under the Pharmacy Act of 1868. Article 14 of the Regulations made in this connexion in 1909, as modified by fresh provision successively in 1911 and 1920, requires that the poisonous substance be sold in an enclosed receptacle distinctly labelled with the name of the substance and the word "Poison" and with the name and address of the seller, and also with a notice of the special purpose for which it has been prepared. The Regulations also require that the licence shall set out on the back *inter alia* Section 17 of the 1868 Act, which directs the seller to enter all sales in a book. The defendants charged at Birmingham had apparently omitted to label the substance as "Poison," to print on the wrapper their name and address, and to enter the sale in the register. Each defendant was fined £1 11*s*. 6*d*. with costs.

The incident is instructive in view of the changes contemplated by the Pharmacy and Poisons Bill which proposes to repeal, amongst other enactments, both Section 17 of the 1868 Act and Section 4 of the 1908 Act. There has been not a little criticism of the fact that the provisions which the Bill proposes to substitute will take away from the qualified pharmacist a considerable part of his work and give it to unqualified persons who do not understand the nature of the dangerous substances which they are allowed to handle.

### Carbon Monoxide Poisoning.

A jury lately awarded £1700 damages to a child whose parents had been found dead in the bathroom of a house at Carshalton. The senior Home Office analyst stated that death was due to coma following

inhalation of carbon monoxide; the plaintiff's case was that gases generated by a gas-burner in the kitchen had found their way into the bathroom by way of the linen-shoot. As usual the cause of action was framed both as breach of contract and breach of duty. The claim alleged that the house was not fit for habitation but dangerous by reason of the gas-burner not having a chimney flue pipe or other outlet; further, that the burner was negligently installed so that the products of combustion were emitted direct into the house. The defendants (from whom the deceased man had taken the house) knew, argued the plaintiff's counsel, of the existence of a dangerous trap, or ought to have known of it, and were under a duty to warn the occupier. The defendants denied all these allegations. The jury found that death was due to carbon monoxide coming from the boiler, that the gas-heater installed by the defendants had no flue and, in connexion with the shoot to the bathroom, was dangerous for use in a dwelling-house, and, finally, that the defendants did not know it was dangerous but ought to have known it. On the effect of this last finding legal argument was necessary. Defendant's counsel said that, if the danger had been concealed, his clients would have been equally liable whether they knew or ought to have known of its existence. But here there was nothing concealed; the dead householder could see all that the defendants could see. The gas-heater, he said, was not dangerous in itself, though it might be dangerous through defect in its construction or the way in which it was worked. The defendants, he argued, had only the duty to give warning of the danger actually known to themselves, and the jury had found that the defendants had no knowledge which could be communicated. Mr. Justice Hawke ruled that the findings of the jury amounted to a decision that the defendants had been negligent in dealing with a dangerous thing (presumably the gases generated by the boiler in the kitchen); he gave judgment for the plaintiff but granted a stay of execution pending appeal. It is the kind of case that may occur elsewhere and, as there seems to be some uncertainty as to the legal liability, an authoritative ruling will be welcome.

## IRELAND.

(FROM OUR OWN CORRESPONDENT.)

### THE SWEEPSTAKES AMENDING BILL.

AN interesting debate took place in the Dáil last week on the second reading of the Sweepstakes Amending Bill, or, to give it its proper title, the Public Charities Hospitals (Amendment) Bill, 1931. The Bill proposes to enlarge the scope of the principal Act in two directions, so as to include new classes of hospital. In the first place, five institutions are included by name. It is understood that these institutions are ineligible under the present Act, in that they do not maintain the requisite number of free beds. In the second place, one-fourth of the proceeds is to go to the county—i.e., rate-supported—hospitals for the purpose of improvement or equipment; "the idea being," said the Minister, "that none of the proceeds should go to the maintenance of patients or directly to the relief of the rates." (One may ask whether equipment is not a duty of the ratepayers, and whether money from an outside source devoted to equipment is not in relief of the rates.) The Bill also provides new machinery for deciding various points concerning sweepstakes by means of a committee of reference which will, in particular, examine the claims of the several charities which apply for participation, and decide on the distribution of the funds. Mr. MacEntee, although not opposing the Bill, pointed out certain dangers in the reliance coming to be placed on sweepstakes. He pointed out that some of the hospitals were being induced to undertake capital expenditure which would impose on them further commitments for maintenance and operation, which, if sweepstakes were to be discontinued, would involve them in grave financial difficulties. On the other hand, Mr. Davin thought that as long as the money was coming from outside countries, there was no reason for discontinuing the sweepstakes, but he thought they should be under the direct control of the State. Sir James Craig thought that some of the hospitals named in the Bill would require scrutiny in committee. As the introducer of the original Act he confessed himself "rather appalled" by the success of the scheme he had started, and he appealed to the Minister to consider whether he should curtail the period for which the original Act was to run. Mr. Good pointed out that while there was a well-informed opinion in favour of amalgamation of the smaller hospitals, the present method of distribution of funds tended to perpetuate the small hospitals, efficient and inefficient. The sweeps might, on the other hand, be used to carry out amalgamation. Several deputies expressed disapproval of the whole system, Mr. Haslett declaring that the Act had made the country a byword among the nations. The Minister, in reply, agreed with Mr. Good that the present would be a suitable time to consider amalgamation, although the question did not arise under the Bill. The second reading of the Bill was agreed to.

## SWITZERLAND.

(FROM AN OCCASIONAL CORRESPONDENT.)

### A SUCCESSFUL ACTION FOR NEGLIGENCE.

AN interesting case of medical responsibility has just been decided by the Federal High Court. In July, 1927, five children of a family in the Lower Engadine developed an affection of the throat. The local practitioner diagnosed in all cases common sore-throat and, when asked by the parents, strictly denied the possibility of diphtheria. As the disease showed no sign of improvement the surgeon of the next district hospital was called in for consultation, with the result that two of the children were transferred to the isolation hospital at Schuls with the diagnosis of diphtheria. Despite injections of serum they both died within the next few weeks. The father of the children, being of opinion that their death was due to wrongful diagnosis, lodged a complaint against the practitioner and asked damages amounting to francs 10,000. District court and cantonal court dismissed the complaint. Both courts, however, agreed that the practitioner did not make use of all methods, such as bacteriological examination, to detect the nature of the disease; that it was possible, even probable, but not certain, that with immediate proper treatment death could have been avoided. The plaintiff lodged an appeal with the Federal High Court. The appeal was successful and damages amounting to francs 3000

were awarded to the parents. The Federal High Court based its decision on the admission of a causal relation between the insufficient treatment and the death of the children. The High Court further stated that wrong diagnosis alone was not sufficient to hold a doctor responsible. In doubtful cases it was, however, the duty of the doctor to use all modern methods to explore the nature of a disease. If this was not done the doctor was negligent and could be held responsible. Both the district and the cantonal court were of opinion that the plaintiff had to prove conclusively and strictly that death could have been avoided by early treatment with serum injections. In most cases such proof was impossible. It was enough for the plaintiff to show that the negligence of the doctor was the probable cause of death. The Federal High Court regarded as generally admitted that with proper serum treatment mortality in diphtheria had been enormously reduced. Therefore the court in the present case found it sufficiently proved that with proper treatment the two children most probably could have been saved.

#### OVERCROWDING IN THE MEDICAL PROFESSION.

This little country has been widely blamed for making it increasingly difficult for foreigners to practise within its borders, but the truth is that the profession is becoming more and more overcrowded. In Switzerland we have one doctor to 1244 inhabitants, a proportion which compares oddly with other countries. In Germany there is one doctor to 1494 inhabitants, in Holland one to 1538, in Denmark one to 1613, in Sweden one to 2947. And despite all warnings the entry is increasing. In 1929 117 students qualified in Switzerland; in 1930, 138. The same plethora is to be seen in the dental and veterinary professions. The situation is such as to have given the Federal Minister of the Interior occasion to write in his last annual report: "All our observations make us fear that the medical professions are becoming more and more overcrowded and that their standard will be gradually lowered. The situation must be remedied. The question is only how this can be effected. One of the remedies proposed, the *numerus clausus*, is not available. We shall approach the subject in conjunction with the medical faculties and the professional groups."

## NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

#### ALL-INDIA MEDICAL CONFERENCE.

THIS year the conference so named was held at Poona, Dr. Jivraj Mehta presiding. As one of India's leading medical politicians no more suitable president could have been chosen. Each year the scientific veneer of this conference wears thinner and its political nature becomes more apparent. The chairman of the reception committee referred to the "antiquated policy of the medical administration of the country which must be thoroughly overhauled," drawing a picture of mediocre I.M.S. officers being given all the best medical appointments over the heads of more highly qualified independent practitioners. But he had by no means stolen all the president's thunder. Dr. Mehta described the action of the General Medical Council in refusing to recognise certain Indian degrees as an undisguised blessing; while it was important for India to have a central organisation of its own to control and correlate medical education and for securing and safeguarding their rights, he considered it essential that the council should have a non-official majority. He drew the attention of the conference to the fact that it was proposed to exclude licentiates from the all-India register, but did not appear to commit himself to a definite opinion on this point. The Bill in question was originally an official measure and in previous conferences was attacked as an attempt on the liberty of the medical profession; it is now criticised because it is insufficiently comprehensive. There was a suggestion of reprisals in Dr. Mehta's remark that in his opinion one of the first acts of the new council should be to ensure that only persons registrable in India should be employed in the civil, military, or naval forces. At present of course nearly all British qualifications are so registrable. Dr. Mehta did not approve of the intrusion of the I.M.S. into the civil side of medical practice and he took exception to the present method of recruitment. He also criticised the composition of the governing body of the Indian Research Fund and of the way they administered this fund. The rank and file of the conference were not to be outdone by their president; no less than 47 resolutions were passed, nearly all disapproving of something or other. They disapproved of the Round Table Conference because it had been suggested there that European doctors should be recruited to look after the European civil officials; they passed votes of censure on the police for interfering with the Congress first-aid volunteers; they condemned the government for providing an insufficient number of facilities for medical education and then again for building too many medical schools, for not providing sufficiently qualified teachers and for paying their teachers too much, and in fact for everything that they had or had not done. The brunt of the criticism fell on the European officers of the I.M.S. for being incompetent, for being overpaid, and for even existing at all—as far as civil practice was concerned. The Red Cross administration was attacked by an officer who had recently been associated with it. All the resolutions were carried unanimously, but the conference was not very constructive.

#### MALARIA NEAR CALCUTTA.

The political situation being quieter the daily press have discovered a malaria scare. The flesh of Calcutta's citizens is made to creep daily by headlines such as "Deadly mosquito advancing on Calcutta," "Firebelt to save Calcutta from malaria epidemic," "Aeroplanes may have to be used," and the like. The facts are that a few months ago a somewhat sharp outbreak of malaria at some of the mills a few miles down the river from Calcutta was investigated. *Anopheles ludlowi* was found to be the cause of it; 90 per cent. of the mosquitoes were of this species and of a large number dissected 24 per cent. were found to be infected. The spleen rate in the area was 90 per cent. Most of the spleens were small, suggesting a recent infection. *A. ludlowi* was known to exist further down the river nearer the sea, but had not been found so near Calcutta before, and fear has been expressed that it might invade the salt lakes from whence the prevailing south wind would soon blow them into Calcutta itself. This species has already been reported in certain places on the river north of Calcutta; it is suggested that they may have been carried there by country boats. The director of public health considered the situation serious enough

to persuade the Minister in charge of his department to call a meeting consisting of the chairmen of local bodies, the public health authorities, and experts from the School of Tropical Medicine. The general consensus of opinion was that no very drastic action was called for, it was agreed to make a systematic survey of the whole area concerned and special investigation into the local conditions which could have accounted for the recent invasion of this species. The press campaign may do good if it succeeds in drawing the attention of the Calcutta Corporation to the fact that mosquito control might be much better than it is at present.

### POPULATION AND DISEASE.

Full figures of the recent census are not yet available, but the first returns show that there has been a considerable increase in the population throughout the whole country during the last decade. Bengal shows an increase of 7 per cent. over the previous census figures. Now that war has been eliminated, pestilence and famine mitigated as population-controlling factors, it is for someone to indicate how the growth of population is to be controlled in future. At present one square mile has to accommodate and support 600 persons on an average throughout the Bengal Presidency. With the diminution in mortality from so-called tropical diseases, such as cholera, plague, malaria, and kala-azar, there has certainly been a considerable rise in the death-rate from tuberculosis. People are flocking to the towns, not only for economic reasons but because of the better water-supplies and the lesser risk of malaria, and Nature is showing her usual tendency to adjust the balance. In his presidential address to the Tuberculosis Association of Bengal, Sir Stanley Jackson spoke in glowing terms of the activities of this association, probably the most useful of which is that of organising house-to-house visits by voluntary workers who give instruction in hygiene. A promising feature of this work is that it has been organised mainly by Indians.

### THE HAFFKINE INSTITUTE.

When Waldemar Haffkine, who died in Switzerland last October, went to Bombay in 1893 at the invitation of the Government of India, he could have had little idea of the extent to which the institute which now bears his name would expand. The original laboratory was utilised for the preparation of plague and cholera vaccines. The report for 1929 shows that in addition to the vaccine department, which serves the whole of India and some countries beyond, research in pharmacology, biochemistry, and other directions is being carried on alongside clinical and general pathological work. The institute has in fact become one of the most important medical activities in the Presidency. New work on plague vaccine has been undertaken for the League of Nations, with the aid of grants from the Indian Research Fund, into such problems as prolonging the period during which the vaccine retains its potency, cutting down the time required for production, using agar instead of broth for cultures, diminishing dose and toxicity without loss of efficiency. In two respects progress is recorded. The vaccine has been found to retain its potency for 18 months, or two years when kept in cold storage; the process of manufacture can be cut down from 12 to six weeks without loss of efficiency, which will make it possible to comply more rapidly with urgent demands. On the other hand, the original broth preparation still holds its own, and there is no evidence that toxicity or dosage can be reduced. Work is being continued on the early detection of contaminants, and on the best method of standardising a virus whose minimal lethal dose can be determined within such narrow limits. With regard to treatment, the quest for a more efficacious serum is still being pursued; judging from its effect on animals, the latest product appears more potent than any previous one and it is hoped shortly to test its value in human plague. The halogenomercuriphenols possess a high germicidal power against *B. pestis* in the test-tube and a safe dosage is being determined with a view to therapeutic test. In the pharmacological department the investigation of indigenous drugs continues, but the director remarks that those who look for startling discoveries will be disappointed. The chief value of this inquiry may be to clear away the superstition and tradition on which the indigenous systems of medicine so largely depend. Inquiries are also being made into maternal morbidity, mortality in childhood, anæmia in pregnancy, stillbirth, and tuberculosis. In the Bombay Presidency the bovine type of bacillus seems to play a negligible part in the causation of human surgical tuberculosis; this is in conformity with the fact, previously known, that in Bombay, where they are seldom housed, tuberculosis of cattle is infrequent, whereas in the colder northern regions of India, where they are housed in winter, the disease is more common. Another important feature of the work of the institute is the production of antirabic vaccine. The Paris strain of fixed virus is now being used exclusively for treatment, but it is yet too early to say whether it is better than the strains hitherto employed.

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## INFECTIOUS DISEASE

### IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 16TH, 1931.

*Notifications.*—The following cases of infectious disease were notified during the week:—Small-pox, 166; scarlet fever, 1469; diphtheria, 897; enteric fever, 26; pneumonia, 1028; puerperal fever, 44; puerperal pyrexia, 91; cerebro-spinal fever, 63; acute poliomyelitis, 5; acute polio-encephalitis, 1; encephalitis lethargica, 16; dysentery, 16; ophthalmia neonatorum, 134. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 19th–20th was as follows: Small-pox, 200 under treatment, 8 under observation (last week 232 and 4 respectively); scarlet fever, 1231; diphtheria, 1476; enteric fever, 14; measles, 188; whooping-cough, 435; puerperal fever, 31 (plus 13 babies); encephalitis lethargica, 188; "other diseases," 159. At St. Margaret's Hospital there were 22 babies (plus 7 mothers) with ophthalmia neonatorum.

*Deaths.*—In the aggregate of great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 38 (2) from measles, 11 (2) from scarlet fever, 24 (7) from whooping-cough, 25 (4) from diphtheria, 40 (16) from diarrhœa and enteritis under two years, and 44 (8) from influenza. The figures in parentheses are those for London itself.

West Hartlepool and Tynemouth reported deaths from enteric fever. Only 2 deaths from meningococcal meningitis occurred in London. Five deaths from measles were reported from each of Birmingham and Liverpool, 4 each from Leeds and Sunderland. Birmingham reported 3 deaths from whooping-cough. Diphtheria claimed 4 victims at Liverpool and 3 at Manchester. Diarrhœa was credited with 5 deaths at Liverpool, 3 each at Birmingham and Manchester. Stoke-on-Trent reported 4 deaths from influenza, Stockport 3, no other great town more than 2.

The number of stillbirths notified during the week was 273 (corresponding to a rate of 41 per 1000 births), including 47 in London.

# PUBLIC HEALTH SERVICES

## SCHOOL MEDICAL SERVICE.

| — | No. on roll. | Average attendance. | Routine inspection. | Special examinations and reinspections | Percentage of defects. |
|---|---|---|---|---|---|
| County of Leicester.. | 38,312 | 34,813 | 11,006 | 10,140 | 16·8 |
| Torquay .. | 4,008 | 3,507 | 1,279 | 6,589 | 21·6 |
| Bootle .. | 11,527 | 10,433 | 3,520 | 15,708 | 35·0 |

### County of Leicester.

Dr. J. A. Fairer's report is so full of information that the routine work must be dismissed in a few words by saying that it is manifestly carried out with efficiency, and though no new schemes have been started in the county during the year there has been a steady development of the orthopædic work, with promise of further coöperation with the city clinic and the opening of several new clinics. The clinic at Coalville is equipped with a visiting orthopædic surgeon and a fully trained masseuse, who gives electrical, radiant heat, and plastic treatment, as well as massage. Throughout the county a special effort is made to include the pre-school children, and Dr. Fairer regrets that the ascertainment of crippling is so incomplete. This work is easier in urban areas where nursery schools are established. Despite difficulties progress has been made towards the supervision of every child from infancy to adolescence. With this ideal in mind there has been established community of staff, carrying forward of information, and availability of treatment. An account is given of a scheme at a central school, where an excellent hot dinner is provided at 3½*d.* per head, with an average gain in weight of nearly half a pound in five months more than in a control group. The girls who assist get valuable lessons in domestic hygiene, and all the children learn good behaviour. Another measure, based on the work of Dr. Corry Mann, is the provision of milk under controlled conditions to 8681 children. In a test group of these weight increased by nearly three-quarters of a pound more in a twelvemonth than in a control group. Dr. J. F. Davidson gives an account of a tour of inspection of physical training; he was struck by the obvious enthusiasm and enjoyment, contrasting with the listless movement in special exercises of ten years ago. Nowadays exercises and games coördinate the whole physical and mental tone. For all school-children, and especially where lighting and ventilation are not up to the mark, there can be no more effective antidote to fatigue than organised games in the open air. A still greater gain lies in the development of sportsmanship and social responsibility. With Dr. Davidson's report should be read that of the chief organisers, who lay similar stress on all-round activities, though they naturally dwell more on ideals and progress than on theoretical achievements. The report contains a study of a scheme for teaching sex hygiene, data on the physical condition of young children, and a continuation of the research on myopia. All this, done in the face of shortage of staff from illness, is evidence of zeal and efficiency.

### Torquay.

Dr. T. Dunlop, in his brief introduction to Dr. J. V. A. Simpson's report, says that the high standard of school medical work in the town has been maintained, although there have been no new developments apart from the completion of arrangements with the Torbay Hospital for dealing with tonsils and adenoids. It is a disappointment to us that Dr. Simpson gives no account of his work on ultra-violet rays in the atmosphere, or of the technique and results of his investigation of the ventilation of the sun lounge at the baths. Crippling defects are now dealt with adequately at the clinic in the town which forms part of the county orthopædic scheme. In all other departments the story is one of progressive development, including extension of treatment facilities to the pre-school child. Last May a new school on the Derbyshire plan was opened on ideal premises with individual towel and model cloakroom arrangements for each child, giving opportunity for the school-child to practise the hygienic way of life. Improvements in the old schools will have their influence on the pupils, and through them on home conditions. In many schools the tone has improved; the wearing of school caps and colours has made scholars take a much keener interest in their personal appearance. An excellent account is given of work at the open-air school. Special mention is made of the rheumatic children, of whom a register is kept, each case being studied individually. Owing to the favourable climate several of them can attend the open-air school, though they are kept at home on wet days and obtain rest and medical treatment on the appearance of any active recurrence. Two severe heart cases have been sent to the Rosehill Children's Hospital.

### Bootle.

Dr. F. T. H. Wood exemplifies in his writings and actions the widening concept of the functions of school medical service. The old idea of confining the work to the detection and removal of existing defects is being left behind; the newer aims at physical and mental culture. In the words of Sir George Newman's report: "Is it a child with some remnants of school information only that the nation needs at 14 or 15 years of age, or is it a child physically fit and alert, sound in sense and limb, disciplined in body and mind?" The education of children in practical hygiene and development of physique and well-being can be furthered in two ways: the proper teaching of hygiene in schools, and the provision of expert guidance in physical training. Many of the new developments in Bootle are of preventive value. Nutrition is being kept up by the provision of milk or milk food to some 3600 children, not because the average standard of nutrition is low (a table shows that the average weight was slightly higher in 1930 than in any of the preceding four years) but because the number of children deemed under-nourished is higher this year. The demands on the clog fund indicate the growing economic need. The work of the remedial exercise clinic is also largely preventive, or at least corrective, directed as it is to the improvement of posture and muscular action. Many of the defects dealt with are postural, like spinal curvature and flat feet; habitual, like mouth breathing; or developmental, like rickets; and, in the last class, the majority were below school age. Special attention is being directed to the prevention of defects already found in children when they enter school. Of the three-year-old children 202 were fully examined at the infant consultation, apart from the much larger number partially examined. Nursery schools form part of the programme for the future; meanwhile baby classes for children from 4 to 4½ were started in four schools, with excellent results. Largely preventive, too, is the work of the rheumatism clinic, which has afforded material for a limited inquiry by Dr. McCloskey. His conclusions generally agree with those of other writers, but he finds rather more relation of rheumatism to tonsillar enlargements and sore-throats; only 28 per cent. of his cases had no signs or symptoms in the throat. The hope is expressed that the teaching of hygiene will soon be formally included in the school curriculum; physical training is being greatly influenced by instructors who as yet belong primarily to the secondary schools. A brief note shows the excellence of the results.

# CORRESPONDENCE

## THE CLEAN MILK PROBLEM.

*To the Editor of* THE LANCET.

SIR,—I have read your leading article of May 9th with great interest, and note that you suggest that we ought to follow the advice of Dr. Savage and enable large local authorities "to require all milk produced or consumed in or entering their area, other than certified or Grade A (T.T.) milk, to be pasteurised." If that suggestion were carried out at an early date it would mean, for all practical purposes, that only an infinitesimal quantity of fresh milk would be available in our large cities. In view of the great improvements in our milk-supplies which are being effected by the milk industry, throughout the country under a voluntary system, and of the necessity for a much more thorough study of the nutritional value of different kinds of milk than has yet been carried out, it would appear that it might be advisable to adopt some less drastic procedure at the present juncture.

The work of Daniels and Stearns,[1] Ladd, Evarts, and Franks,[2] and Lewis[3] appears to demonstrate that there is a real difference in the nutritional values of fresh milk and milk that has been treated. This view is supported by R. A. Fisher and S. Bartlett[4] in their reading of the results of the Lanarkshire experiment. A study of their letter to *Nature* shows that in their opinion the results obtained in this experiment demonstrate that the boys and girls who received raw milk increased both in weight and height much more than those who received pasteurised. They also note that the boys gained greater relative benefit than the girls. This conclusion is very interesting when considered in relation to the work of C. V. Mattick and J. Golding,[5] who fed generations of rats on raw, pasteurised, and sterilised milk, and found that the weights of the bucks were much more rapidly affected by the different types of milk that were given to them than those of the does. The fact that Fisher and Bartlett's conclusions were reached quite independently of Mattick and Golding gives weight to them.

All the recent experiments on milk feeding in schools have demonstrated that those children who received the milk did much better than those who did not receive it. From these results two conclusions may be drawn, first that milk is a wonderful foodstuff, and second that the ordinary diets of these children did not enable them to attain the highest physical standard. This conclusion is confirmed by J. B. Orr and M. L. Clark in a study[6] of the diets of 607 families in Scotland which showed that in fact "the great majority were incapable of supporting the optimum-rate of growth." The chief medical officer of health of the Board of Education in his annual report for 1929 has also stated that "there is evidence to show that there is a large amount of 'subnormality' amongst secondary school-children, not severe enough to be labelled malnutrition, but which judged in relation to the period of the child's life, and the heavy and competitive strain of the secondary school curriculum, may lead to serious conditions of ill-health."

It would appear that at the present time two steps at least are necessary. On the one hand, to ensure that a complete study of the nutritional values of different types of milk shall be carried out; and on the other, to be careful that any legislation which may be passed shall ensure the progress of the production of a clean milk which is free from disease and not be limited to regulations which would tend to reduce the supplies of fresh milk in our large cities to a negligible quantity. This has been the effect of compulsory pasteurisation in all those countries which have hitherto adopted it.

I am, Sir, yours faithfully,

R. STENHOUSE WILLIAMS.

The National Institute for Research in Dairying, Shinfield, near Reading, May 21st, 1931.

[1] Jour. Bio. Chem., 1924, lxi.
[2] Archives of Pediatrics, 1926, xliii.
[3] Report of the Certified Milk Conference, U.S.A., 1927.
[4] Nature, April 18th.
[5] THE LANCET, March 21st, p. 662.
[6] THE LANCET, 1930, ii., 594.

## AIR MOVEMENT IN SANATORIA.

*To the Editor of* THE LANCET.

SIR,—As one of the 50 members of a group which visited Canada and America last summer to study tuberculosis, I was struck, as we all were, by the difference in the circulation of air inside their sanatoria and hospitals and ours. This difference is primarily due to the necessity they are under of using meshed nets to prevent insects getting into the wards and verandas. I was reminded myself of the feeling of being in a camp bed netted against mosquito or sandfly. Now, assuming that their results are about as good (or as bad) as our own, does this observation not suggest that we may be overdoing the open-air treatment in this country? I am aware that, now that sanatoria here utilise such methods as artificial pneumothorax, phrenic avulsion, exercises, and so forth, the basic element of open air is not as outstanding a feature in treatment as it was years ago. Nevertheless a patient told me the other day that he had left a sanatorium as they invited him to enter a bed covered with snow—and in my opinion he acted rightly. There must be a number of clinicians still with us who were on the staff of chest hospitals before sanatorium treatment came into being, and it would be of interest to learn what value they set on the movement of air in treatment. Personally I have modified my principles of treatment very considerably. I have been struck too, in motoring through towns and villages in winter time, by the fact that there are no more open windows than there were when sanatorium benefit came into force in 1912.

I am, Sir, yours faithfully,

J. D. MACFIE.

Winsley Sanatorium, near Bath, May 21st, 1931.

## CHAIRS OF PHYSIOLOGY.

*To the Editor of* THE LANCET.

SIR,—In the generous review of my booklet on the history of physiology of the Clio Medica series, which appeared in your issue of May 2nd, attention is directed to the chair of physiology at the University of Glasgow, and the statement is made that when McKendrick succeeded Buchanan in 1876, the title of the chair was changed from "Institutes of Medicine" to "Physiology." This would place it before the Waynflete chair at Oxford, which was created in 1878. Before publishing the statement that the Oxford chair was the second in Great Britain, I

inquired of Prof. E. P. Cathcart, of Glasgow, as to the circumstances of the founding of his chair. In a letter dated March 3rd, 1930, he replied that the designation Institutes of Medicine "was changed by Ordinance No. 31, dated 5 June, 1893, to Physiology (without any reason being given in the Ordinance—merely the bald statement)." I realise that the question merely involves a quibble as to the official designation of a chair, for McKendrick, in a very real sense, *was* a professor of physiology in 1876; but if Prof. Cathcart's statement is correct, I believe it justifies the assertion made in my book that the chair of physiology at Oxford was second in Great Britain, being preceded only by the chair at Edinburgh, which was renamed in 1874.

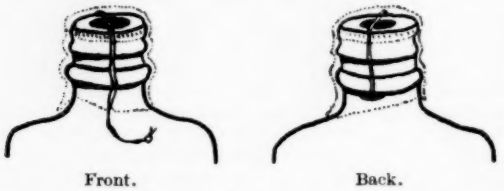
I am, Sir, yours faithfully,
J. F. FULTON.

New Haven, Conn., U.S.A., May 12th, 1931.

## APPARATUS FOR BLOOD CULTURE.

*To the Editor of* THE LANCET.

SIR,—We have tested the apparatus for blood culture described by Dr. J. E. McCartney in THE LANCET of March 14th, and are satisfied that it is a great improvement on that previously in use in this laboratory, especially in reducing the risk of accidental contamination of the medium. The method of removing the viscap suggested was to run the edge of a penknife around the screw cap, so cutting through



Front. Back.

the viskap, to insert the point of the knife under the upper half of the viskap, and to flick off the latter. In practice this was not always quite so easy as it appeared, and occasionally the viskap tended to adhere rather firmly to the metal cap. Dr. G. C. Dockeray suggested to me the use of a thread under the viskap as a method of removing this covering, and the following arrangement has now been adopted by us.

When the medium has been placed in the bottle and the screw cap tightened, a stout linen thread is firmly tied around the neck of the bottle, below the projecting glass rim which is situated at a lower level than the edge of the metal cap. The two ends of the thread are brought over the top of the cap and down the other side of the neck, and the viskap fitted on. After sterilising and drying, the viskap holds the thread in place. When required for use, the two projecting threads are pulled, so splitting the viskap, which either flies off itself or can be flicked off. The illustrations, for which I am indebted to Dr. H. J. O'D. Burke-Gaffney, make the method of attaching the thread clear. In them the position of the viskap is indicated by the dotted lines.

I believe that this slight modification will still further improve the exceedingly useful apparatus described by Dr. McCartney.

I am, Sir, yours faithfully,
JOSEPH W. BIGGER.

School of Pathology, Trinity College, Dublin,
May 18th, 1931.

## HUGHLINGS JACKSON MEMORIAL.

*To the Editor of* THE LANCET.

SIR,—Since the publication of the letter in your last issue additional subscriptions have come in from Dr. Russell Brain, Dr. Percy Kidd, Prof. Ashley Mackintosh, Dr. F. M. R. Walshe, Prof. Harvey Cushing (Boston), Dr. Bernard Sachs (New York), and Dr. Edwin Bramwell.

I am, Sir, yours faithfully,
WILFRED HARRIS.

56, Wimpole-street, W., May 25th, 1931.

## CLINICAL TYPES OF HÆMOPTYSIS.

*To the Editor of* THE LANCET.

SIR,—Reading your report (p. 1136) of Dr. Hebert's excellent paper at the Tuberculosis Association on May 15th, I am led to wonder whether the classification he suggests is not rather too complicated for practical purposes, and whether indeed it is possible to distinguish clinically between arterial and venous hæmoptysis. The classification which I have advocated for some years is:—

1. The initial hæmoptysis, usually small—say a mouthful—but which may range from a trace only to a large quantity of blood. This indicates active disease, whether it be the first manifestation, or merely an indication of recrudescence, and the treatment for it is the treatment for active disease.

2. The small recurrent hæmoptysis occurring in chronic cases slight or severe, often associated with secondary infections. This can usually be ignored, and the patient reassured.

3. The severe hæmoptysis giving symptoms due to loss of blood, requiring treatment to that end, and often best dealt with by an artificial pneumothorax. Pathologists have told me that these large hæmoptyses often arise from cavities near the root of the lung.

I am, Sir, yours faithfully,
ERNEST WARD.

Paignton, May 26th, 1931.

## TUBERCLE BACILLI IN THE BLOOD.

*To the Editor of* THE LANCET.

SIR,—In the final paragraph of your annotation on this subject on p. 1148 of your last issue there is, I think, a slight confusion as regards the medium. The "asparagin" medium is the latest one employed by Prof. Löwenstein, and although I am experimenting at the present time with this medium, the results published in my article were obtained by the use of Löwenstein's original egg medium.

I am, Sir, yours faithfully,
H. M. SCHWABACHER.

May 27th, 1931.

## OVERCROWDING AS A FACTOR IN OUTBREAKS OF CEREBRO-SPINAL FEVER.

*To the Editor of* THE LANCET.

SIR,—While Prof. Dudley's reply in THE LANCET of April 18th throws further very interesting light on his views, the fresh data he presents may be thought to be not wholly convincing. He supports his objection to my theory in regard to the importance of atmospheric humidity (indoor humidity in particular) as a factor in outbreaks of cerebro-spinal fever by referring to three facts of argument: (1) that the carrier rate was (presumably during the war period) often as high in ships as in barracks; (2) that the morbidity of influenza and tonsillitis is at times

as high to-day on ships as formerly when ventilation was non-existent; (3) that meningitis, in its most general acceptation, was a rare disease in the Fleet over the 20 years 1860–79, when ventilation was as bad in sea-going ships as in training ships.

The reasons to which I wish to call attention are: (1) Gordon's English types I., II., III., and IV., and Nicolle's corresponding French types A and B, of agglutinating sera, for differentiating between agglutinable and non-agglutinable strains (that is, between epidemiological and non-epidemiological meningococci), did not come into general use before the middle of 1916 or early in 1917. As is generally known, the introduction of these sera eliminated much confusion and greatly enhanced the value of subsequent carrier-rate findings. In the absence of qualifying information as to the relative proportions of agglutinable and non-agglutinable meningococci met with, and of *identical* experimental factors, might not the statistical value of comparative carrier-rate determinations be considered a little vitiated? (2) Considering morbidity as a function of bacterial resistance, rather than in the sense implied by Prof. Dudley, the still high morbidity of influenza and tonsillitis infections would surely be explained by the greater resistance of this group of germs to external conditions—e.g., ventilation—than the meningococcus. (3) The meningococcus not being discovered before 1887, can relevant statistics of anterior date be altogether relied upon in a discussion of this kind?—I am, Sir, yours faithfully,

Alexandria, Egypt, May 19th, 1931. A. COMPTON.

# OBITUARY

## SEYMOUR TAYLOR, M.D. Aberd., F.R.C.P. Lond.,

CONSULTING SURGEON TO THE WEST LONDON HOSPITAL.

WE regret to announce the death of Dr. Seymour Taylor which occurred on May 30th at 21, Wembley Park-drive, in his eightieth year. He had recently retired from practice.

Seymour Taylor was born at Derby in 1851, the son of Mr. Thomas D. Taylor of that town. His preliminary education was received at a private school until he entered the University of Aberdeen as an under-graduate. Here he joined the medical faculty, later completing his medical education at St. Thomas's Hospital, where he was a prizeman. He took the diploma of M.R.C.S. in 1872 and the M.B., C.M. Aberdeen in 1877, proceeding to the M.D. degree in 1881. At St. Thomas's Hospital he was for some time demonstrator of anatomy, and in 1886, while still holding that post, he was appointed assistant physician to the West London Hospital, beginning then his long connexion with that institution. He held the demonstratorship of anatomy at St. Thomas's for another four or five years, and throughout all his clinical work he was always greatly interested in structural anatomy; he was an examiner at different times in the subject at the English Conjoint Board and at the University of Aberdeen. At the West London Hospital he was a vigilant member of the staff, taking especially great pains in the out-patient department with the diagnosis and treatment of the very varied cases which reached the institution. His thoroughness and also his kindness were obvious to his patients, thus removing any impression due to the direct and sometimes abrupt nature of his interrogatories. In 1900 Taylor became full physician to the hospital, and in this year he was elected F.R.C.P. He was also physician to the North London Consumption Hospital, but he made no direct studies of pulmonary disease. He was always a general physician, though he took special interest in cardiology.

Seymour Taylor made considerable literary contributions to medicine and wrote one book which passed deservedly through three editions. This was his "Index of Medicine," which was published in 1894. The simple design of the work was that it should be a handy manual for students preparing for final examinations, and for this purpose the arrangement of the subject matter was admirable, while many practitioners found the volume a handy one for reference. Other contributions deserving of notice are the analyses of the cases of enteric fever treated in St. Thomas's Hospital during the period 1878–1881, and published in St. Thomas's Hospital reports; to these reports, indeed, he made frequent contributions, usually displaying anatomical knowledge. Several papers on aortic insufficiency were published in THE LANCET, and contributions appeared from him in various journals dealing with anatomical points as they came up for notice. He wrote also a series of papers on Acute Pneumonia and another series on Health for the Middle Aged, the latter of which was published in a volume.

Dr. Taylor was consultant physician to the Equitable Assurance Society after many years connexion with that body; and among other interests of an active professional life he was ex-president of the West London Medico-Chirurgical Society, a medical officer to the Board of Education, had been treasurer of the Medical Defence Union, and was on the Council of Epsom College. To the interests of this last institution he was particularly devoted, missing very few meetings of the Council and contributing usefully to its deliberations until shortly before his death.

Dr. Seymour Taylor married Edith, eldest daughter of Edgar W. Bishop, of Hendon Park, Mill Hill.

## ALFRED T. MacCONKEY, M.B., D.P.H. Camb.

BACTERIOLOGISTS in all parts of the world who are familiar with the use of MacConkey's medium must have felt that a break with the past had occurred when the death of Dr. A. T. MacConkey was announced. During the past five years he had been living in retirement in Surrey, where he died on May 17th.

Alfred Theodore MacConkey was born in 1861, the youngest son of the late Rev. Andrew MacConkey, of West Derby, Liverpool. He received his scientific training at Caius College, Cambridge, and obtained honours in the Natural Science Tripos. He proceeded to Guy's Hospital, whence he graduated M.B., B.Ch., in 1889. He held the post of senior house surgeon at Guy's, and then settled in practice at Beckenham in Kent. He had acquired a reputation as a sound, capable, and well-liked practitioner, when, after an attack of influenza, he had a nervous breakdown; he decided to abandon general practice and to turn aside into the quieter paths of bacteriological research.

After working for a time with Washbourn and Eyre in the laboratories of his old hospital, he was associated, as bacteriologist, with the Thompson-Yates laboratories in Liverpool under the late Sir Rubert Boyce. His appointment about this time as assistant bacteriologist to the Royal Commission on

Sewage Disposal, whose working headquarters were at Leeds, determined the trend of his researches during the early years of the century. The problems that called for solution fascinated him, and his interests were soon deeply engaged in the technical part of the work. During the period 1900–1909 the results of his investigations were published in a number of papers, which embody his pioneer researches upon the classification of the lactose-fermenting bacteria of intestinal origin, and upon the differential criteria and the significance of this group as contaminants of water, milk, and foodstuffs.

The introduction of his bile-salt medium put into the hands of bacteriologists a simple and effective tool for the separation of the typhoid-dysentery group of bacilli, and it proved of especial value in the estimation of coliform bacteria in the routine examination of water-supplies. Bile-salts had been added to media as early as 1889, and MacConkey's first experiments with them were made in 1897; in 1900 he used a bile-salt lactose agar for the purpose of isolating *B. typhosus* and *B. coli communis*. The addition of neutral red as a differential colour indicator for colonies that either do or do not ferment lactose was suggested in 1902 by Grünbaum and Hume, and this improvement in the method was adopted by MacConkey. He was one of the first to appreciate the importance of noting and comparing the biochemical activities of the intestinal group of bacilli with the object of defining their specific characters and their relationships.

In November, 1901, he joined the staff of the Lister Institute, London, as an assistant in the bacteriological department. The change proved to be the second turning-point in his career, for his transference soon afterwards to the serum department of the Institute at Elstree, then under the charge of the late Prof. George Dean, diverted his energies to the solution of the problems which surround the preparation of toxins and antitoxins. In April, 1906, he became the head of the department, and he remained at Elstree until his retirement in April, 1926, at the age of 65 years. He continued the early work of his colleague, Prof. J. C. G. Ledingham, on serum concentration, and developed the technical processes for refining and concentrating antitoxic sera. There are workers in many countries who owe their practical knowledge of the subject to the information which MacConkey freely put at their disposal. In 1912 he contributed to the reports of the Plague Research Commission in India an interesting paper on the production and titration of anti-plague serum, which showed that the specific antitoxin can be concentrated by the usual methods, and that it is associated with the pseudo-globulin fraction of the serum proteins.

During the years of the war MacConkey took a keen interest in the prophylaxis and treatment of tetanus by means of antitoxin, and he published several papers on the subject; some of them collated the experience of numerous observers in many countries, and others gave an account of experimental work carried out by himself and his colleagues. He served as a member of the War Office Committee for the investigation of tetanus. In his published articles he entered a strong plea for devoting special attention to the early signs and symptoms of tetanus, on the ground that the antitoxin is likely to influence the disease only when administered as soon as the symptoms are recognisable. The limited response to his appeal and the scanty information which came to hand disappointed him, but it is probable he had not sufficiently realised the difficulty of discriminating between the early subjective symptoms of tetanus and those which were attributable to sepsis, to traumatic shock, and to the nervous strain from which the patients were suffering.

During the war MacConkey put his energies without stint into the task of enlarging and organising his department to meet the increasing demands made upon it by the army authorities for tetanus antitoxin, anti-dysentery serum, and anti-meningococcus serum. The strain of the work weakened his resistance, and rendered him subject to influenzal attacks; these gave rise to an obscure cardiac disability from which he never really recovered.

Dr. G. F. Petrie writes: "MacConkey was a man of a quiet disposition, of simple tastes, and with a natural charm of manner, which was most evident in his home and among the pleasant surroundings of his garden at Elstree, where Mrs. MacConkey and he dispensed amiable and delightful hospitality. He was a lover of animals, and a skilful gardener with a passion for cultivating roses. He was a good raconteur, and possessed a keen sense of humour. He held tenaciously to his opinions, and this feature of his character and the steady persistence with which he pursued refractory technical problems may doubtless be traced to the sturdy independence of the Northern Ireland stock from which he came. The high standard by which he was wont to judge the conduct of others led him at times to assume an unyielding attitude, but those of his friends who knew him best believed that this was a defensive reaction on the part of a modest and sensitive nature; it is certain he followed closely his fine ideals of service."

# PARLIAMENTARY INTELLIGENCE

## NOTES ON CURRENT TOPICS.

### WHITSUNTIDE ADJOURNMENT.

ON May 21st, in the House of Lords, the Workmen's Compensation Bill passed through committee. Their lordships adjourned for the Whitsuntide recess until June 5th. The House of Commons adjourned on May 22nd until June 2nd.

## HOUSE OF COMMONS.

WEDNESDAY, MAY 20TH.

### Price of Milk in London.

Sir WALTER PRESTON asked the President of the Board of Trade if he was aware that one of the principal retail milk-supplying firms in London was charging 2*s.* per gallon for milk for which they only paid the farmer 9½*d.* per gallon, delivered at the London termini; and whether, in view of the importance of milk as a diet for children and invalids, he could take steps to correct the difference between the wholesale and retail prices.—Mr. W. R. SMITH (Parliamentary Secretary to the Board of Trade) replied: I am aware that the usual retail price of milk in London is as stated. The price paid to the farmer under the Terms of Settlement approved by the Permanent Joint Milk Committee varies according to circumstances, but I have no information as to the particular case referred to. I have no power to alter the prices of milk but the Consumers' Council Bill contains provisions which would invest the Board of Trade with certain powers to deal with prices found to be excessive.

### Experiments on Living Animals at Reading.

Mr. FREEMAN asked the Home Secretary whether he was aware that Mr. S. P. Male, of Reading, had, during 1930–31, performed a number of experiments on living animals for the purpose of gland grafting, calculated to give pain;

that no licence had been granted to this gentleman; and what action he proposed to take in the matter.—Mr. SHORT (Under Secretary for the Home Office) replied: My right hon. friend has inquired into the facts of this case and finds that the operations in question were performed by Mr. Male in the ordinary course of veterinary practice for the purpose of treatment of the patients. They were, therefore, not experiments within the meaning of the relevant statute, and my right hon. friend has no jurisdiction in the matter.

Mr. FREEMAN: Is no licence required in a case of this description even although pain is caused?

Mr. SHORT: My right hon. friend has no jurisdiction at all.

### Infantile Mortality in Scotland.

Miss LEE asked the Secretary for Scotland (1) the counties in Scotland where there were the highest and lowest infantile mortality-rates, and the deaths per 1000 in these two counties, and (2) the average infantile mortality-rate for Scottish counties.—Mr. WESTWOOD (Under Secretary for Scotland) replied: The average infantile mortality-rate for the whole of Scotland, excluding burghal areas in 1930, was 69 per 1000 births. The mean of the rates for the individual counties (again excluding burghs) was 61 per 1000. The highest rate was 89 per 1000 in Dunbartonshire, and the lowest was 23 per 1000 in Bute. If my hon. friend intended to include burghal areas, the answer to question No. 53 would be that the highest rate was 100 per 1000 in Wigtownshire and the lowest 25 per 1000 in Bute; but I should have to make further inquiry as to average rates.

### Public Health Meat Regulations.

Mr. THORNE asked the Minister of Health the date of the rescission of the order made under the Public Health Meat Regulations, 1908, prohibiting such imports as boxed loins and legs of pork, boneless beef, and other forms of scrap meat used by sausage manufacturers; the reason for the original prohibitions; and what fresh facts were disclosed to justify the rescission.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: The Public Health (Foreign Meat) Regulations of 1908 and 1909 were revoked in 1925, but their substance was re-enacted with slight modifications by the Public Health (Imported Food) Regulations, 1925. The importation of scrap meat (i.e., meat which affords insufficient means of identification with definite parts of a carcass) is still prohibited, the reason for the prohibition being that such meat cannot be satisfactorily inspected at the time of importation. Boxed loins and legs of pork have never been regarded as scrap meat and their importation has always been allowed if they are accompanied by official certificates recognised as satisfactory by the Minister of Health. The official certificate of a number of countries have been recognised for this purpose at various dates from 1909 to 1929.

THURSDAY, MAY 21ST.

### Government and the Factories Bill.

Sir KINGSLEY WOOD asked the Home Secretary the present position with regard to the Factories Bill.—Mr. CLYNES replied: As I explained in reply to a previous question the Government have been anxious to proceed with this Bill during the present session if it seemed practicable, having regard to other commitments, to carry it through all its stages. I am afraid that in view of the legislation to which Parliament is already committed, and the present state of business, a postponement of this Bill for the present session appears now to be inevitable.

### Shortage of R.A.M.C. Officers.

Lieut.-Colonel FREMANTLE asked the Secretary to the Treasury whether the proposed inter-departmental committee to inquire into the shortage of officers of the Royal Army Medical Corps had yet been appointed; and, if so, if he would state the terms of reference and personnel of the committee.—Mr. PETHICK-LAWRENCE (Financial Secretary to the Treasury) replied: The Committee has not yet been set up. It is, however, hoped that it will be possible to announce its composition and terms of reference in a few days' time.

Lieut.-Colonel FREMANTLE: In the composition of this committee is consideration being given to the fact that a great deal depends on the future career offered in civil life after these officers retire, and is it considered therefore possible to include some representatives of the civil services which employ the services of medical officers?

Mr. PETHICK-LAWRENCE: I am afraid I should have notice of that question.

### Insane and Mentally Deficient Persons.

Sir NICHOLAS GRATTON-DOYLE asked the Minister of Health how many insane and mentally deficient persons had been a charge on the funds of the State and local authorities in each of the years 1928, 1929, and 1930.—Mr. GREENWOOD replied: The following is the information asked for:—

*Chargeable to the State.*

| — | On Jan. 1st— | | |
|---|---|---|---|
| | 1928. | 1929. | 1930. |
| *Mentally Deficient Persons.* | | | |
| In State institutions .. | 690 | 785 | 884 |
| *Insane Persons.* | | | |
| Criminals .. .. .. | 803 | 910 | 909 |
| In naval and military hospitals .. .. .. | 174 | 163 | 152 |
| "Service" and "ex-Service" patients .. .. | 5,543 | 5,402 | 5,295 |
| Total (insane) .. | 6,520 | 6,475 | 6,356 |

*Chargeable to Local Authorities.*

| | | | |
|---|---|---|---|
| *Insane Persons.* | | | |
| — | 122,754 (*a*) | 125,534 (*a*) | 126,941 (*a*) |
| *Mentally Deficient Persons.* | | | |
| In institutions(under Order) | 17,683 (*b*) | 19,138 (*b*) | 20,629 (*b*) |
| Under Section 3 (M.D. Act, 1913) .. .. .. | 170 | 172 | 177 |
| Guardianship .. .. | 1,143 (*b*) | 1,372 (*b*) | 1,559 (*b*) |
| In "places of safety" .. | 265 (*b*) | 261 (*b*) | 216 (*b*) |
| Total (mentally deficient) | 19,261 (*c*) | 20,943 (*c*) | 22,581 (*c*) |

(*a*) Including cases chargeable to board of guardians, and cases in public assistance institutions and in receipt of outdoor relief.

(*b*) 50 per cent. of cost contributed by the State. (N.B.—Under the Local Government Act, 1929, the State contribution of 50 per cent. ceased on March 31st, 1930.)

(*c*) Not including cases under statutory supervision.

### Nurses' Hours and Wages.

Mr. BROCKWAY asked the Prime Minister whether the Government was prepared to provide facilities for the further stages of the Nursing Profession (Wages and Hours) Bill.—Mr. MACDONALD replied: I regret that I can hold out no hope of time being found for the discussion of this Bill.

Lieut.-Colonel FREMANTLE: Will the right hon. gentleman recognise that there is no demand for this Bill among the nursing profession, and that it is a political stunt of the Labour party?

No further answer was given.

### Co-operative Societies and Insurance Prescriptions.

Sir KINGSLEY WOOD asked the Minister of Health whether he proposed to make such alterations in the present regulations as would permit co-operative societies to make a monetary payment to their customers in respect of national health insurance prescriptions.—Mr. GREENWOOD replied: This matter has been the subject of very recent legal proceedings, and until the period for appeal against the decision has expired it would not be proper for me to make any statement.

### Approved Societies' Funds.

Mr. THOMAS LEWIS asked the Minister of Health the amount actually credited to approved societies in accordance with Section 4 of the National Health Insurance Act, 1926, as amended by Section 21 of the National Health Insurance Act, 1928, for the purpose of preventing insured persons who were in arrears from being, or continuing to be, subject to reduction or suspension of benefits.—Mr. GREENWOOD replied: The sum of £500,000 available in respect of arrears in the contribution year ended July 7th, 1929, is in process of distribution to approved societies. The distribution of the £500,000 in respect of arrears in the contribution year ended July 6th, 1930, is awaiting the receipt of returns from the societies.

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JEWISH HOSPITALS.—Last year the London Jewish Hospital (108 beds) received 1666 in-patients, a considerable increase; out-patient attendances increased from 60,444 to 65,873, chiefly by reason of patients referred for treatment to special departments. The weekly cost of each in-patient went up from £3 2*s.* 8*d.* to £3 4*s.* 7*d.*—The foundation-stone of the Bernhard Baron extension of the Victoria Memorial Jewish Hospital in Manchester was laid recently by Mr. J. H. Thomas, Secretary of State for the Dominions, Sir Louis Baron, Sir William Cundiff, and Mr. R. Barrow-Sicree. This marks the beginning of an extension, to cost £40,000, which will provide 25 additional beds, 11 private wards for paying patients, two new theatres and other accommodation.

# MEDICAL NEWS

## University of Cambridge.

On May 22nd the following degrees were conferred :—

*Sc.D.*—A. S. Parkes.
*M.B. & B.Chir.*—F. G. Wood-Smith.

*Lane Presentation.*—The presentation to John Lane, senior steward of the anatomical department, will be made on Tuesday, June 2nd, at 5 P.M., in the Anatomy School. It will consist of a gold watch and chain, together with a cheque, a short address, and a list of the subscribers.

## Royal Colleges of Physicians and Surgeons of England.

At the Final Examination of the Conjoint Board, held from April 13th to May 4th, the following candidates were approved in the undermentioned subjects, but are not eligible for the diplomas of the Colleges :—

*Pathology.*—J. H. Beale, Sheffield ; E. H. S. Bebb, London ; H. T. L. Broadway, St. Thomas's ; S. B. Bromberg, St. Mary's ; J. Burdon-Cooper, Univ. Coll. ; T. Chadderton, Manchester ; Barbara G. C. Clarke, Univ. Coll. ; R. C. Cohen, Univ. Coll. ; J. G. Connell, Sheffield ; F. N. Corfe, L.D.S. Eng., Guy's ; E. H. de B. Crowther-Smith, Guy's ; E. J. Currant, London ; D. Davidson, Univ. Coll. ; R. T. Elvey, Guy's ; C. D. Evans, St. Mary's ; A. C. Gladstone, St. Thomas's ; H. F. Green, St. Bart.'s ; A. Greenberg, St. Bart.'s ; H. J. Griffiths, Middlesex ; M. A. F. A. Hadi, Birmingham ; Winifred S. Hall, Univ. Coll. ; W. Hedgcock, St. Thomas's ; A. Hollinrake, St. Bart.'s ; Mary T. Howard, Charing Cross ; S. V. Humphries, St. Thomas's ; B. Hynes, Middlesex ; J. M. Jackson, St. Bart.'s ; Annie L. Jones, Univ. Coll. ; L. Kessel, and J. S. Lane, Guy's ; H. H. Langston, St. Bart.'s ; E. S. Lee, Westminster ; A. A. Lewis, Guy's ; J. T. R. Lewis, Middlesex ; P. Lewis, Leeds ; W. H. Lewis, Guy's ; M. A. Lloyd, St. Bart.'s ; I. A. MacDougall, Guy's ; G. J. McFarlane, St. Thomas's ; J. G. McGrath, Manchester ; J. W. McLaren, St. Thomas's ; R. L. Mansi, St. Bart.'s ; W. A. Mayne, St. Thomas's ; C. F. Mayo-Smith, St. George's ; G. J. Meikle, Middlesex ; T. F. B. Noble, London ; N. C. O'Byrne, St. Thomas's ; C. G. Owen, Edinburgh and St. Mary's ; G. T. Partridge, St. Bart.'s ; R. C. T. Pearson, St. Thomas's ; F. W. J. Platts, King's Coll. ; Joyce A. Pope, Manchester ; C. R. D. Porter, and T. W. H. Porter, Middlesex ; S. Prakash, M.B., Charing Cross ; Eluned M. Puleston-Jones, Lond. Sch. Med. ; H. M. Rashid, Birmingham ; G. F. Rees-Jones, Univ. Coll. ; B. Roberts, Univ. Coll. ; I. C. Robertson, St. Thomas's ; G. Scott, Middlesex ; M. Shankhla, Leeds ; J. R. S. Sharp, Guy's ; R. E. H. Simpson and D. G. Snell, St. Thomas's ; W. P. Stamm, Guy's ; S. Sutton, Manchester ; G. H. Taylor, Guy's ; Winifred P. Thomas, Univ. Coll. ; H. H. Thompson, Manchester ; W. F. Townsend-Coles, London ; Patricia I. Unsworth, Liverpool ; H. C. M. Walton, St. Mary's ; J. H. West, St. Bart.'s ; Shirley E. Whitaker, Univ. Coll. ; H. G. Williams, St. Thomas's ; H. T. S. Wise, King's Coll. ; F. H. Wood, Birmingham ; S. L. Wright, Univ. Coll. ; J. Zeitlin, London.

*Medicine.*—E. Anfilogoff, London ; E. J. Baldwin, St. Thomas's ; A. V. Baliga, King's Coll. ; K. Baxter, Manchester ; C. M. Bell, St. Bart.'s ; Eleanor H. Brooks, M.B., Royal Free ; C. Budeiri, M.D., London ; Winifred M. Burbury, Leeds ; M. J. L. Burtenshaw, Guy's ; K. V. Earle, St. Thomas's ; Joanna M. Egerton, King's Coll. ; A. G. Evans, Birmingham ; G. A. Fleet, M.D., McGill ; S. G. French, King's Coll. ; M. J. Garber, Guy's ; H. N. Garrus, Guy's ; Rachel N. Gillespie, Royal Free ; V. Glass, Univ. Coll. ; L. Glick, Leeds ; S. Goide, Charing Cross ; A. Greenberg, St. Bart.'s ; G. H. Greenway, Guy's ; G. W. Hall-Smith, Guy's ; S. T. Hayward, St. Bart.'s ; J. E. Jenkyn-Thomas, St. Bart.'s ; D. Johnson, King's Coll. ; A. A. Kidvai, King's Coll. ; E. A. Knappett, Univ. Coll. ; M. Kosloff, Guy's ; N. I. Kronenberg, L.M.S.S.A., Guy's ; B. Lawn, St. Thomas's ; D. T. Lewis, St. Mary's ; H. L. Lightstone, Middlesex ; E. H. W. Lyle, L.M.S.S.A., King's Coll. ; R. M. Marshall, St. Bart.'s ; R. W. C. Murray, Birmingham ; C. G. Nicol, L.M.S.S.A., St. Mary's ; S. Prakash, M.B., Charing Cross ; P. Pringle, King's Coll. ; Eluned M. Puleston-Jones, Lond. Sch. Med. ; J. Reeve, Westminster ; W. F. Richards, St. Bart.'s ; P. Rosenfeld, St. Bart.'s ; Mary A. Saunders, King's Coll. ; M. Schlaff, St. Bart.'s ; G. Scott, Middlesex ; E. Sharp, Guy's ; H. Simmons, St. Bart.'s ; G. L. Stroud, St. Mary's ; R. A. Sykes, St. Bart.'s ; G. Tattersall, Manchester and Univ. Coll. ; A. B. Waters, St. Bart.'s ; M. Westwood, St. Bart.'s ; D. I. A. Williams, Liverpool ; A. H. Zair, Birmingham.

*Surgery.*—A. M. M. M. Ali, Middlesex ; W. H. Bradbeer, Guy's ; T. E. Burrows, St. Bart.'s ; Beatrice L. Campion, Lond. Sch. Med. ; A. M. Cantor, Guy's ; W. I. Card, St. Thomas's ; C. P. Collins, Univ. Coll. ; H. A. Constable, Guy's ; A. B. Cook, St. Bart.'s ; A. H. Dunkerley, Manchester ; S. Durham, and N. M. Durrani, London ; Joanna M. Egerton, King's Coll. ; G. R. Ellis, Liverpool ; L. S. Everett, King's Coll. ; G. A. Fleet, M.D., McGill ; N. A. Gillespie, London ; J. H. L. Gilmore, St. Thomas's ; G. P. Gladstone, London ; A. J. B. Goldsmith, Middlesex ; W. H. Greany, Guy's ; H. N. Gregg, Birmingham ; H. L. Griffiths, Middlesex ; Sheila M. Harper, Liverpool ; D. C. Harris, Middlesex ; F. Hilmy, Durham ; L. C. Holland, Bristol ; J. H. Hughes, Liverpool ; B. Hynes, Middlesex ; K. C. Jeffery, London ; W. P. Jenson, Westminster ; Alice M. Kaye, King's Coll. ; C. A. Keane, St. Bart.'s ; Victoria H. King, Lond. Sch. Med. ; N. L. Lamb, Cardiff and Guy's ; J. S. Lane, Guy's ; A. W. Langford, St. Bart.'s ; N. R. C. Lansdell, King's Coll. ; A. M. P. Laurent, Univ. Coll. ; B. Lawn, St. Thomas's ; R. A. Q. Lay, Guy's ; T. M. A. Lewis, London ; J. Littlejohn, St. George's ; P. H. Lomax, Guy's ; J. R. B. McBride, St. Bart.'s ; G. J. McFarlane, and J. W. Macmillan, St. Thomas's ; I. W. H. Mansfield, L.M.S.S.A., Middlesex ; P. G. C. Martin, Manchester ; A. Miller, Guy's ; M. A. N. Moezuddin, St. Thomas's ; A. K. Monro, London ; P. B. Moroney, Liverpool ; I. Moshinsky, Guy's ; Edith A. Muirhead, Lond. Sch. Med. ; P. G. A. Nambiar, Madras and Lond. Sch. Med. ; L. G. Norman, Univ. Coll. ; Lily M. O'Hanlon, King's Coll. ; C. G. Owen, Edin. and St. Mary's ; G. T. Partridge, and G. F. Petty, St. Bart.'s ; T. J. Phillips, Univ. Coll. ; A. L. Potter, Liverpool ; J. Rabinovitch, Leeds ; M. Ripka, London ; H. D. Robertson, St. Bart.'s ; C. H. Rogerson, Guy's ; J. T. Rowe, St. Bart.'s ; E. Rudkin, Birmingham ; N. L. Rusby, St. Thomas's ; C. Rutter, Guy's ; E. S. StJohn, Guy's ; J. A. E. Scott, Middlesex ; R. B. Scott, St. Bart.'s ; E. W. H. Shawcross, King's Coll. ; H. Shoukry, Birmingham ; A. B. Simmons, King's Coll. ; K. Singh, St. Thomas's ; R. G. W. Southern, St. Thomas's ; P. Q. M. Spaight, St. Bart.'s ; D. Stone, Guy's ; G. L. Talwar St. Thomas's ; G. W. Thomas, St Bart.'s ; J. G. Vincent-Smith, St. George's ; S. O. Widmann, H. G. Williams, and A. L. Wingfield, St. Thomas's ; and Dorothy Woodman, Lond. Sch. Med.

*Midwifery.*—S. S. Alam, M.B., Punjab ; Isha M. Ali, Royal Free ; A. Ascher, King's Coll. ; E. J. Baldwin, St. Thomas's ; A. V. Baliga, King's Coll. ; G. N. Barker, St. Thomas's ; C. H. Bateman, St. Bart.'s ; R. A. Beaver, St. Thomas's ; G. I. Benjamin, Madras and Guy's ; G. F. Benjamin, Liverpool ; J. B. Bishop, St. Thomas's ; R. W. Blakey, Leeds ; H. Blumovitch, St. Bart.'s ; H. E. Bonnell, King's Coll. ; J. R. Braybrooks, King's Coll. ; H. T. L. Broadway, St. Thomas's ; S. B. Bromberg, St. Mary's ; M. J. Brookes, London ; G. O. Brooks, St. Mary's ; N. P. Bruce, Charing Cross ; Winifred M. Burbury, Leeds ; J. Burdon-Cooper, B.Sc., St. Andrew's, Univ. Coll. ; F. J. Burke, Liverpool ; M. J. L. Burtenshaw, and A. M. Cantor, Guy's ; L. G. Clayton, St. Thomas's ; R. R. Clipstein, St. Mary's ; A. J. P. Coetzee, London ; N. C. Coombs, Camb. and Bristol ; W. E. P. Corbett, St. Mary's ; H. W. Cowen, Univ. Coll. ; Doris Critchley, Royal Free ; L. M. Crooks, Liverpool ; J. E. Davenport, London ; D. Davidson, Univ. Coll. ; T. A. L. Davies, St. Thomas's ; S. C. De, Middlesex ; R. J. de Carteret, Birmingham ; G. A. Dickson, Sheffield ; A. E. Dudley, King's Coll. ; G. G. M. Edelsten, St. Bart.'s ; H. Edwards, Guy's ; G. R. Ellis, Liverpool ; A. G. Evans, Birmingham ; C. D. Evans, St. Mary's ; Jennie G. Evans, Westminster ; L. S. Everett, King's Coll. ; G. G. Exner, L.D.S. Eng., Guy's ; J. Fishman, London ; J. F. P. Forster, Birmingham ; F. W. A. Fosbery, Bristol ; J. W. H. Foy, Liverpool ; A. C. Gladstone, St. Thomas's ; F. R. Glover, London ; P. W. Godfrey, Leeds ; D. C. Green, St. Thomas's ; H. N. Gregg, Birmingham ; M. Hafezi, St. Mary's ; Winifred S. Hall, Univ. Coll. ; H. A. R. Hamilton, W. P. Hedgcock, and E. A. Hoare, St. Thomas's ; E. K. Hole, St. Bart.'s ; A. Hollingsworth, St. Thomas's ; J. Howell, Guy's ; J. H. Hughes and T. L. Hughes, Liverpool ; Daisy G. Iliff, King's Coll. ; J. M. Jackson, St. Bart.'s ; L. S. Jaikaran, London ; J. A. James, Charing Cross ; W. P. Jenson, Westminster ; D. Johnson, King's Coll. ; P. W. E. Jones, St. Bart.'s ; T. B. Jones, Westminster ; T. J. Jones, Univ. Coll. ; Alice M. Kaye, King's Coll. ; R. L. Kennedy St. Mary's ; B. S. Lange, Guy's ; A. W. Langford, St. Bart.'s ; N. Langdon-Down, London ; H. H. Langston, St. Bart.'s ; R. E. Lauder, Charing Cross ; W. S. G. Lawson, St. Thomas's ; R. A. Q. Lay, Guy's ; E. S. Lee, Westminster ; S. B. Levy, Liverpool ; A. A. Lewis, Guy's ; T. M. A. Lewis, London ; L. H. B. Light, St. Thomas's ; H. F. Loewenthal, Liverpool ; P. H. Lomax, Guy's ; K. Malik, L.D.S., London ; R. A. Manclark, Middlesex ; M. H. Masina, St. Bart.'s ; Oonah L. Matthews, Univ. Coll. ; M. T. Maung, N.B., Rangoon, Guy's ; J. W. Meanley, Leeds ; S. G. Meanley, Leeds ; M. A. N. Moezuddin, St. Thomas's ; I. D. Monger, Charing Cross ; W. J. Morris, Liverpool ; Irene P. Murray, King's Coll. ; P. H. Mankivell, Middlesex ; K. H. Nassif, Royal Free ; A. H. Osmond, Birmingham ; Norah W. K. Petter, Royal Free ; A. L. Potter, Liverpool ; S. Prakash, M.B., Charing Cross ; P. Pringle, King's Coll. ; D. F. Robb, St. Thomas's ; B. Roberts, Univ. Coll. ; P. G. Roberts, St. Bart.'s ; I. C. Robertson, St. Thomas's ; R. D. Roper, St. Bart.'s ; H. Rosenberg, Guy's ; Irene P. Rowlands, Charing Cross ; E. Rudkin, Birmingham ; E. S. StJohn, Guy's ; O. A. Savage, St. Bart.'s ; Marie W. E. Schuyt van Castricum, Royal Free ; C. K. Shain, Leeds ; M. H. Sherwell, Birmingham ; R. F. Simkin, St. Mary's ; R. E. H. Simpson, St. Thomas's ; H. M. Singer, King's Coll. ; N. W. Sivolella, St. Bart.'s ; R. H. Smith, St. Thomas's ; R. E. G. Smith, Birmingham ; V. Swaminathan, Manchester ; D. J. Swamy, Durham ; J. W. C. Symonds, St. Bart.'s ; J. C. S. Thomas, St. Bart.'s ; J. R. Thornton, St. Thomas's ; R. C. Walch, St. Bart.'s ; G. Walker, London ; Lilian I. Walker, Leeds ; Clara M. Warren, Royal Free ; H. Waterman, Leeds ; F. C. H. White, St. Bart.'s ; J. L. Wightman, Leeds ; C. E. R. Wood, Guy's ; and J. Zeitlin, London.

## University of Liverpool.

The title of professor emeritus has been conferred on Dr. Edward William Hope, formerly professor of public health in the University and medical officer of health for the city and port of Liverpool.

## University of Manchester.

The University Court has resolved to grant the honorary degree of master of science to Dr. Alexander Brown Ritchie, for over 20 years school medical officer of the city of Manchester.

### University of London.

At a meeting of the Senate on May 20th Dr. E. L. Kennaway was appointed to the University chair in experimental pathology (tenable at the Cancer Hospital (Free)). Dr. Kennaway has been chemical pathologist at the hospital since 1921. The title of professor of pathological chemistry was conferred on Mr. C. R. Harington, Ph.D., F.R.S., in respect of the post held by him at University College Hospital Medical School. The title of emeritus professor of experimental pathology was conferred on Sir Charles Martin, M.B., F.R.S., and that of emeritus professor of biochemistry on Mr. Arthur Harden, D.Sc., F.R.S., on their retirement from the Lister Institute of Preventive Medicine.

The Dunn exhibitions in anatomy and physiology for 1931 were awarded respectively to E. W. Bintcliffe, of St. Bartholomew's Hospital Medical College, and S. O. Aylett, of King's College.

Convocation has reappointed Sir Ernest Graham-Little, M.D., M.P., as a member of the Senate.

### University of Leeds.

When the centenary of the School of Medicine is celebrated on July 1st the honorary degree of Doctor of Science will be conferred on Sir Walter Fletcher, F.R.S., secretary of the Medical Research Council, and on Sir Gowland Hopkins, P.R.S., professor of biochemistry in the University of Cambridge. The honorary degree of Doctor of Laws will be conferred on Dr. Alfred George Barrs, emeritus professor of clinical medicine in the university; Sir John Bland-Sutton, formerly President of the Royal College of Surgeons of England; Lord Dawson of Penn, President of the Royal College of Physicians of London; Dr. Arthur Hawkyard, Lord Mayor of Leeds; Sir George Newman, chief medical officer to the Ministry of Health and the Board of Education; and Dr. Jane Walker, medical superintendent of the East Anglian Sanatorium, Nayland.

### Papworth Village Settlement.

Mr. Greenwood, the Minister of Health, last week laid the foundation-stone of a new hospital for women at the Papworth Village Settlement for Sufferers from Tuberculosis.

### Research Defence Society.

The annual general meeting of this society will be held at the house of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., on June 10th, at 3.30 o'clock, when the Stephen Paget memorial lecture will be delivered by Dr. H. H. Dale, director of the National Institute for Medical Research, on the Effect of Research on Curative Medicine. Lord Lamington, the President, will take the chair.

### Charing Cross Hospital Medical School.

In view of the success of the recent Sunday post-graduate course, it has been decided to hold another during the next two months. It begins on May 31st with a lecture at 10.45 A.M. by Dr. W. J. Adie on Sudden Attacks of Nervous Origin, and one at 11.45 by Mr. Peter Daniel on Diseases of the Colon. Particulars will be found each week in our Medical Diary. Application for membership of the course should be made to the secretary of the school, 62, Chandos-street, W.C. 2.

### Royal Institute of Public Health.

At the inaugural meeting of the congress of the Royal Institute of Public Health, held in the University of Frankfurt a. Main on Tuesday, May 19th, the Harben gold medal of the institute was presented to Prof. William Henry Welch, of Baltimore, in recognition of his eminent services to the public health. At the same meeting the rector of the University presented to Sir William Smith, the principal of the institute, the Ehrlich-Weigert medal of the Medical Faculty. On the following day the Oberbürgermeister, on behalf of the city of Frankfurt, presented to the institute the medal of honour of the city "in remembrance of the congress, which was the first to be held on German soil for 19 years," and handed the medal to Sir Thomas Oliver, the distinguished representative of the institute.

### Belgrave Hospital for Children.

Last year 2210 in-patients were admitted; they cost £3 3*s*. 7*d*. per head. Ninety-five per cent. of them came from South London. As soon as means are available the overcrowded out-patients' department is to be rebuilt. A ward of 12 beds is now available for the children of parents of moderate means, at a fee of £3 3*s*. per week; the medical staffs' fees are fixed in accordance with the circumstances of the parents. What is claimed to be a new departure in hospital practice has come into operation recently. Arrangements have been made with practitioners in the neighbourhood whereby consultations with members of the staff may be arranged at reduced rates for parents who cannot afford the ordinary consultants' fee. These consultations are available only on the recommendations of the practitioner.

### Lord Mayor Treloar Cripples Hospital and College.

On Founders' Day, Monday next, June 1st, Admiral Sir Roger Keyes will open the Portsmouth block of the hospital, and Lord Burnham will preside at the function.

### Royal London Ophthalmic Hospital.

Last year there was a surplus of income over expenditure of £1798. Towards the second portion of the reconstruction scheme, which will cost £40,000, there is now available £13,500. There is a daily average of 478 out-patients.

### St. Bartholomew's Hospital, Rochester.

Last year there were 1935 in-patients and 9201 new out-patients. Each in-patient costs £8 5*s*. 11*d*. (residence 21·9 days) and each out-patient 6*s*. 8*d*. The first year's working of the Association of Friends (contributory scheme) produced £4000, of which £3000 was entirely new money.

### King's College Hospital.

The annual festival dinner, over which Lord Burnham presided, took place at Merchant Taylors' Hall last week when £6000 was raised. It was stated that the hospital is 200 beds behind the needs of the population served, and that in 1930 expenditure exceeded income by £13,500. Nearly half the income was provided by patients' payments. An appeal is being made for £27,000 to facilitate the provision of larger accommodation for private patients.

### Royal Free Hospital.

The annual report states that by the end of 1930 the Eastman Dental Clinic had been completed and was in working order, and the venereal diseases clinic rehoused, while the Albert Levy wing was well advanced. The completion of the nurses' home is to be proceeded with as soon as possible. The year ended with a deficit of £5457, and "the General Fund is now insolvent to the extent of £25,517."

### Composition and Description of Food.

The Minister of Health and the Secretary of State for Scotland have appointed a committee to inquire into the working of the law as to the composition and description of articles of food other than milk, and to report what alterations, if any, in the law or its administration appear to be desirable. Sir Frederick Willis, is the chairman and the members include Dr. J. M. Hamill. The secretary is Mr. W. J. Peete, of the Ministry of Health, to whom communications may be addressed.

### King Edward VII. Hospital, Windsor.

Two wards have been added to this hospital, and during 1930 a third theatre was provided at the cost of Sir Joseph Skevington and his brother, Major Skevington. The pathological department has been removed to more convenient quarters, and the old department has been converted into a chapel which was last week dedicated by the Bishop of Buckingham. The contributory scheme last year produced £9646, an increase of more than £1000.

### Bolingbroke Hospital: Proposed Extension.

In the annual report the governors call attention to the dilapidated condition of the old mansion portion of the building at Wandsworth which is "almost impossible" to remedy. They are therefore contemplating an extension which, in addition to providing further beds for patients, will not only replace the accommodation of the old building, but will enable it to be demolished to make room for additional wards. Last year there were 2458 new in-patients who stayed an average of 16·2 days, as against 15·8 days in 1929.

### University College Hospital.

Last year there were 8898 in-patients (540 beds) and 81,895 out-patients. The average stay of each in-patient was 20·39 days; the cost per occupied bed was £181, and each out-patient cost 5*s*. 3*d*. A speech clinic has been instituted which deals with stammering and other speech defects, and it has been decided to establish a department of clinical research under the charge of Sir Thomas Lewis. Eight private wards have been provided in the Royal Ear Hospital, and the general committee have in mind the establishment, when circumstances permit, of a private hospital of 100 beds on a site in the immediate neighbourhood. The income last year was £107,448 and the expenditure £106,537.

### Kent County Ophthalmic and Aural Hospital.

As the result of the recent extensions in-patients increased last year by 550, and the out-patients numbered 33,744, of whom 21,642 were ophthalmic cases. In addition there were 5765 ophthalmic and 2261 aural casualties. Candidates for various treatments brought up the total number of out-patients to 44,637, an increase of nearly 10,000 over 1929. Owing to the cost of alterations and improvements, and the addition of 33 beds, the hospital has a debt of £20,000. Last year the contributory fund provided over £13,000.

### Donations and Bequests.

Among other bequests the late Sir Harold J. Reckitt left £5000 to the Hull Royal Infirmary; £2000 to the Hull and East Riding Convalescent Home; £1000 to the Victoria Children's Hospital, Hull; £800 to the Royal County Hospital, Chichester; £600 to the Hull Dispensary, and £200 to the Emsworth (Hants) Cottage Hospital.

### New Infirmary at Chard.

A new infirmary has been added to the Chard Public Assistance Institution. It has cost £10,000, is a two-storey building of concrete, and has 48 beds. The nursing staff are placed in an adjoining bungalow.

### Royal Eye Hospital.

It is proposed to rebuild this hospital, at St. George's-circus, Southwark, at an estimated cost of £150,000. The beds would be increased from 46 to 80, and more private wards would be provided, together with larger space for research work and out-patients.

### Lyndhurst Maternity Block.

Miss Fenwick, president of the Fenwick Cottage Hospital, Lyndhurst, has presented the institution with a completely equipped maternity block formed by the conversion of some cottages close to the main building. There are two three-bed wards.

### St. George's Hospital.

At the annual court of governors last week Prince George, the President, stated that the income last year was £87,388, and the expenditure £83,825. There were 5000 in-patients and 4000 operations. Lord Greville, the treasurer, said that the hospital is faced with the prospect of making an appeal for a large sum either for an entirely new building or for complete reconstruction of the old one.

### Hospital Surpluses.

Last year the Queen's Hospital for Children, Hackney-road, had a credit balance, the first for 20 years, of £1408, as compared with a deficit of £1618 in 1929.—St. Helen's Hospital had a surplus of £1019 and St. John's Hospital for Diseases of the Skin, £1111.

### Victoria Hospital for Children.

The average daily number of in-patients in 1930 was a fraction over 105, as compared with 94 in 1929, and their average weekly cost fell from £3 9*s.* 9*d.* to £3 7*s.* 6½*d.* The cost of maintaining the hospital and the convalescent home at Broadstairs was £26,386; the income was £24,251. During 1930 the ladies' association granted £715 to the hospital.

### Enlargement of Bolton Infirmary.

The first extensions of this institution since it was built 50 years ago, consisting of the Nathan Barnes and Colin Cooper wards, were recently formally opened by Mrs. Colin Cooper, widow of one of the donors, and Miss Barnes, sister of the other donor. Each ward has cost £10,000.

### Bath Orthopædic Hospital.

A new ward for 20 babies was recently opened by Mrs. Stanley Wills at the Bath and Wessex Children's Orthopædic Hospital. The addition, which is due to the generosity of her son, Mr. R. D. Wills, brings up the accommodation to 92 beds. Of the £30,000 required to complete a scheme for a further 50 beds, £18,250 has already been raised.

### Royal Salop Infirmary.

Since the Road Traffic Act came into force and insurance of motorists became obligatory this institution has recovered between 60 and 70 per cent. of the cost of treating patients injured in motor accidents. The expenditure last year was £20,658, leaving a deficit of £2778. Among the receipts the two historic annual fixtures, the anniversary service and the infirmary ball, produced between them over £2200.

### Paybody Convalescent Home.

A new ward which has been added to the Paybody convalescent home of the Coventry and district crippled children's guild at Allesley, near Coventry, was opened recently by Sir Edward Iliffe. The ward, which has cost about £5000, provides accommodation for 20 boys and 20 girls. There are between 1100 and 1200 children on the books of the guild.

### Metropolitan District Nursing Association.

At the annual meeting last week it was stated that last year the nurses from the Bloomsbury home paid more than 57,000 visits, and that the work of the St. Pancras home had been so heavy that, notwithstanding the addition of another nurse, continuous help had to be given by the main home. There is a deficit of £1000 upon the St. Pancras branch.

# Medical Diary

***Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.***

## SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

FRIDAY, June 5th.—9.30 A.M., LARYNGOLOGY. Summer Meeting. Papers and Demonstrations:—Dr. A. Brown Kelly and Prof. Leonard Findlay: Congenital Shortening of the Œsophagus, and the Thoracic Stomach Resulting Therefrom. Dr. H. Graham Hodgson: The Radiography of Sinusitis (with Film). Prof. Georges Portmann (Bordeaux): Treatment of Cicatricial Stenosis of the Œsophagus by Anto-dilatation. Sir StClair Thomson: A Permanent Tracheostomy in Stenosis of the Larynx. 5 P.M., Clinical Meeting (Cases at 4 P.M.). Demonstration of Instruments:—Mr. O. O. Popper: Broncho-œsophagoscope. Cases and specimens will be shown by Mr. W. Ibbotson, Mr. Walter Howarth, Mr. V. E. Negus, Mr. W. H. Jewell, Dr. T. A. Clarke, Dr. C. F. Beevor, Mr. Herbert Tilley, and Sir James Dundas-Grant.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

FRIDAY, June 5th.—8.15 P.M. (at the Kensington Town Hall). Prof. Julian Huxley: Development in Relation to Heredity and Evolution, illustrated by slides (Cavendish Lecture).

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

THURSDAY, June 4th.—5 P.M., Prof. M. J. Stewart: Precancerous Lesions of the Alimentary Tract (First Croonian Lecture).

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, June 1st.—10 A.M., Gynæcological Ward Visit, Genito-Urinary Operations, Skin Department. 11 A.M., Surgical Ward Visit. 2 P.M., Surgical Ward Visit. Medical, Surgical, Eye, Gynæcological Out-patients.

TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Clinical Demonstrations. 2 P.M., Medical, Surgical, Throat Out-patients, Operations, Medical Ward Visit.

WEDNESDAY.—10 A.M., Medical Ward Visit, Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients, Gynæcological Operations. 4.45 P.M., Venereal Diseases.

THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Treatment of Fractures. 2 P.M., Medical, Surgical, and Eye Out-patients, Genito-Urinary Department. Operations.

FRIDAY.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients. Operations.

SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Surgical and Children's Medical Out-patients.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, June 1st.—12 noon, Dr. Greenfield: The Cerebro-spinal Fluid. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Hinds Howell: Sciatic Neuritis.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic.

WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Cerebral Tumours (1).

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Carmichael: Palsies Associated with Pregnancy and Parturition.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, Gower-street, W.C.

MONDAY, June 1st.—5 P.M., Dr. F. C. Shrubsall: Mental Deficiency from the Social, Legal, and Educational Aspects.

TUESDAY and THURSDAY.—5 P.M., Dr. C. J. Thomas: Physically Defective Children.

FRIDAY.—5 P.M., Mr. R. R. Hyde: Industrial Welfare.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, June 3rd.—Visit to Malted Milk Co., Ltd., Slough, Bucks.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, W.

TUESDAY, June 2nd.—5 P.M., Dr. André Gratia: The Shwartzman Phenomenon.

CITY OF LONDON MATERNITY HOSPITAL, City-road, S.E.

THURSDAY, June 4th.—5 P.M., Mr. W. McKim McCullagh: Causes of Maternal Mortality.

CHARING CROSS HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

SUNDAY, May 31st.—10.45 A.M., Dr. W. J. Adie: Sudden Attacks of Nervous Origin. 11.45 A.M., Mr. Peter Daniel: Diseases of the Colon.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, June 5th.—4 P.M., Mr. Lowndes Yates: The Recognition and Treatment of Early Carcinoma of the Throat and Nose.

CHADWICK PUBLIC LECTURES.
THURSDAY, June 4th.—5 P.M. (at the Chelsea Physic Garden), Mr. T. F. Chipp, D.Sc.: Trees and Man.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, June 2nd.—3.15 P.M., Dr. P. O. Ellison and Dr. Janet Vaughan: Demonstration in the Pathological Department.

UNIVERSITY OF BIRMINGHAM.
TUESDAY, June 2nd.—3.30 P.M. (at the General Hospital), Mr. H. H. Sampson: Clinical Surgical Cases.
THURSDAY.—4 P.M., Prof. Blair Bell: Maternal Disablement (Last Ingleby Lecture).
FRIDAY (at the Queen's Hospital).—3.30 P.M., Prof. Billington: Demonstration of Surgical Cases.

# Appointments

KIDMAN, G. E., M.B., B.S. Lond., has been appointed Honorary Assistant Physician to the Derbyshire Royal Infirmary.

Certifying Surgeons under the Factory and Workshop Acts: BRIMS, D., M.B., Ch.B. Edin. (New Galloway District, Kirkcudbright); MURRAY, A. R., M.B., Ch.B. Edin., Poulton-le-Fylde, Lancaster.

# Vacancies

*For further information refer to the advertisement columns.*

*Accrington Victoria Hospital.*—Hon. Anæsthetist. Also H.S. £150.
*Albert Dock Hospital, Connaught-road, E.*—Dental Surgeon.
*Belfast, Campbell College.*—Res. M.O.
*Birmingham Ear and Throat Hospital, Edmund-street.*—H.S. At rate of £150.
*Birmingham General Hospital.*—Res. Surg. Reg. £100–£120–£140. Two Res. Anæsthetists. Each £120. Also Res. H.S. £70.
*Birmingham, Highbury Hospital, Moseley.*—Res. Asst. M.O. £300.
*Birmingham, P.H. Dept.*—Asst. M.O. for Tuberculosis Section. £400.
*Blackburn Royal Infirmary.*—4th H.S. £150.
*Bury County Borough.*—Asst. M.O.H., &c. £500.
*Cancer Hospital, Fulham-road, S.W.*—H.S. At rate of £100.
*Canterbury, Kent and Canterbury Hospital.*—H.P. and H.S. Each at rate of £125.
*Cardiff, King Edward VII. Welsh National Memorial Assn.*—Area Asst. Tuber. Physician. £600.
*Cardiff, Llandough Hospital.*—Med. Supt. £750.
*Carlisle County Borough.*—Asst. M.O.H. £650.
*Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.*—Hon. Assts. to Out-patients' Dept.
*Chesterfield and North Derbyshire Royal Hospital.*—Cas. O. At rate of £200.
*City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.*—H.P. At rate of £100.
*Connaught Hospital, Walthamstow, E.*—Res. H.P. At rate of £100.
*Coventry and Warwickshire Hospital.*—Res. H.S. £125.
*Derby, Derbyshire Hospital for Sick Children.*—Res. H.S. and Res. H.P. At rate of £150 and £130 respectively.
*Derby, Derbyshire Royal Infirmary.*—Ophth. H.S. £150.
*Doncaster Royal Infirmary.*—H.S. At rate of £175.
*Durham, County Council.*—District Tuber. M.O. £500.
*Durham County Council and Chester-le-Street U.D.C.*—District Tuber. M.O. and M.O.H. £800.
*East London Hospital for Children and Dispensary for Women, Shadwell, E.*—Res. Cas. O. £125.
*Essex Administrative County.*—Asst. County M.O.H. £500–£600.
*Exeter, Royal Devon and Exeter Hospital.*—Res. Sen. H.S. £250. Also Res. H.S. and H.S.to Spec. Depts. Each at rate of £150.
*Gloucester, Gloucestershire Royal Infirmary, &c.*—H.S. At rate of £120.
*Hammersmith Hospital, Ducane-road, Shepherd's Bush, W.*—Res. Med. Supt. £950.
*Hospital for Sick Children, Great Ormond-street, W.C.*—H.S. and H.P. Each at rate of £100.
*Ilford, King George Hospital.*—H.S. At rate of £100.
*Kidderminster and District General Hospital.*—H.S. £150.
*King's Lynn, West Norfolk and King's Lynn Hospital.*—Jun. H.S. At rate of £125.
*Lancaster Royal Infirmary.*—Jun. H.S. £130.
*Leeds Hospital for Women.*—H.S. At rate of £50.
*Leicester Royal Infirmary.*—H.P. At rate of £125.
*London, Female Lock Hospital, 283, Harrow-road, W.*—H.S. at rate of £150.
*London Temperance Hospital, Hampstead-road, N.W.*—Cas. O. and H.P. At rate of £120 and £100 respectively.
*Macclesfield, Cheshire County Mental Hospital, Parkside.*—Asst. M.O. £350.
*Manchester Babies' Hospital, Burnage-lane, Levenshulme.*—Sen. and Jun. Res. M.O.'s. At rate of £125 and £50 respectively.
*Manchester and District Radium Institute.*—Asst. M.O. At rate of £300–£500.
*Manchester Ear Hospital, Grosvenor-square, All Saints'.*—H.S. £150.
*Manchester, Royal Children's Hospital.*—Sen. M.O. for Out-patients' Dept. £300.
*Manchester Royal Infirmary.*—H.S. for Central Branch, Roby-street. At rate of £100.
*Manchester, Withington Hospital.*—Two Asst. M.O.'s. Each at rate of £275.
*Miller General Hospital, Greenwich-road, S.E.*—H.P., H.S. Each at rate of £125. Also Out-Patient Officer. At rate of £150.
*National Hospital for Diseases of the Nervous System, Queen-square, W.C.*—Hon. Asst. Radiologist.
*Newcastle-upon-Tyne, Hospital for Sick Children.*—H.S. At rate of £100.
*Nottingham General Hospital.*—Cas. O. At rate of £200.
*Oldham Royal Infirmary.*—H.P. and Cas. O. Each at rate of £175.
*Plymouth, Central Hospital.*—H.S. At rate of £140.
*Princess Louise Kensington Hospital for Children, St. Quintin-avenue, North Kensington, W.*—H.S. At rate of £100.
*Queen Mary's Hospital for the East End, E.*—Hon. Asst. Obstet. Surgeon and Gynæcologist. Hon. Neurologist. Res. M.O. and Cas. O. At rate of £200 and £150 respectively. Also H.P.'s and H.S.'s. At rate of £120.
*Reading, Royal Berkshire Hospital.*—Res. Anæsthetist. At rate of £150.
***Rotherham Hospital.*—Cas. H.S. £150. Also Sen. H.S. £200.**
*Royal Free Hospital, Gray's Inn-road, W.C.*—Res. H.P.'s and H.S.'s to Special Depts. Unit Anæsthetist and District Obstet. Asst. £100. Also Cas. O. £150.
*Royal Free Hospital, Eastman Dental Clinic, Gray's Inn-road, W.C.* Res. H.S.
*Salford Royal Hospital.*—H.P. and H.S. Each at rate of £125.
*Sheffield Children's Hospital.*—H.P. and Third Res. M.O. At rate of £100 and £80 respectively.
*Sheffield, Jessop Hospital for Women.*—Three Asst., H.S.'s. Each at rate of £100.
*Southampton County Borough.*—M.O.H. &c. £1250.
*Southampton, Royal South Hants and Southampton Hospital.*—Res. H.P. and 2 H.S.'s. All at rate of £180.
*Stoke-on-Trent, Longton Hospital.*—H.S. £120.
*Walsall, County Borough.*—Asst. Tuber. O., &c. £750.
*Walsall General Hospital.*—H.S. At rate of £150.
*West Bromwich, Great Barr Children's Homes &c.*—Asst. Res. M.O. £275.
*West Bromwich, Hallam Hospital.*—Res. H.S. £250.
*West London Hospital, Hammersmith-road, W.*—H.P. and two H.S.'s. All at rate of £100.
*Westminster Hospital Annexe, 66, Fitzjohn's-avenue, Hampstead.*—M.O. At rate of £300.
*Windermere, Ethel Hedley Orthopædic Hospital for Crippled Children.*—Res. H.S. £150.
*Windsor, King Edward VII. Hospital.*—Two H.S.'s. Each at rate of £100.
*Wolverhampton, Royal Hospital.*—H.S. At rate of £100.
*York County Hospital.*—H.S. Also Res. Anæsthetist and Asst. H.S. Each £150.
*York, The Retreat.*—Sen. Asst. M.O. £400–£500.

The Chief Inspector of Factories, Home Office, S.W., announces a vacancy for a Certifying Factory Surgeon at Grosmont (Yorks, N. Riding).

# Births, Marriages, and Deaths

## BIRTHS.

BARKER.—On May 20th, at Jesmond, the wife of Valentine Holland Barker, M.R.C.S., L.R.C.P., of a son.
PARKER.—On May 20th, at Sandgate, Kent, the wife of Dr. F. Gerald Parker, of a daughter.
WILSON.—On May 22nd, at Cedar House, Radlett, Herts, the wife of Dr. A. G. Wilson, of a daughter.

## MARRIAGES.

RICHARDSON—LEA.—On May 20th, at Marylebone, Gilbert Richardson, M.A., M.D., of Manor House, N.W., to Hilda, daughter of the late C. A. Lea and of Mrs. Lea, of Elsworthy-terrace, South Hampstead, N.W.

## DEATHS.

GOOD.—On May 21st, on board s.s. *Cavina*, Arnold Saxty Good, M.R.C.S., L.R.C.P., of High Bickington, N. Devon.
HALLIBURTON.—On May 21st, at a nursing home in Exeter after an operation, William Dobinson Halliburton, M.D., F.R.S., Emeritus Professor of Physiology, King's College, London.
MORTON.—On Whit Sunday, suddenly, at Gillingwood, Ulundi-road, Blackheath, S.E., John Edmondson Morton, M.R.C.S., L.R.C.P.
TAYLOR.—On May 20th, 1931, at 21, Wembley Park-drive, Seymour Taylor, M.D., F.R.C.P., late of Seymour-street, W. 1, and St. Thomas's Hospital, in his 80th year.
WATERHOUSE.—On May 23rd, at Wimpole-street, W Sir Herbert F. Waterhouse, M.D., F.R.C.S., aged 67.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.*

EAST HAM MEMORIAL HOSPITAL.—In 1930 this hospital, which has now received full recognition as a training school for nurses, admitted 1484 patients, an increase of 679, and the 6140 new out-patients made 23,259 attendances. In-patients costs £3 12*s.* 7*d.* per week, a fall on the previous year of 8*s.* 9*d.*; out-patients cost about 5*s.* 4½*d.* each. The total deficit at the end of the year was £15,922.

# NOTES, COMMENTS, AND ABSTRACTS

## THE COAL-MINER.

Two Chadwick public lectures on the Coal-miner, His Health and Occupational Diseases, were given in London by Prof. E. L. Collis on May 15th and 18th. Describing a visit to a mine, he said that the light given by safety lamps, which had to be used in most coal pits, was less than that given by the candles which, of old, miners placed in their caps, and so brought fairly close up to the coal upon which they worked with the pick. The illumination to-day was so dim that the eyes of miners became affected; they could not be held steady, but oscillated involuntarily. These eye movements occurred in many miners, of whom a few were troubled with distressing eye movements and incapacitated from work. Miners' nystagmus topped all other occupational diseases added together for which workmen's compensation was paid; it was estimated to cost the mining industry about £1,000,000 a year.

The number of claims for compensation among coal-miners was very high. Thus in 1929 23 per cent. of miners employed claimed compensation, as against 12 per cent. of dockers, 4 per cent. of railway men, and 3·8 per cent. of factory operatives. For diseases alone, out of a total of 10,518 cases, including all forms of industrial disease for which first payments were made during 1929, the miner claimed 8500; and out of 8143 cases continued from previous years, he was responsible for 7629. Yet, out of the total number of 7,450,112 persons employed under the terms of the Compensation Acts, the miner only claimed 930,780. After nystagmus the next most frequent disease was beat-knee, with 3406 new cases and 175 old; followed by beat-hand with 1708 new cases and 134 old. There were also claims for 458 new cases and 35 old of beat-elbow, and 316 new and 13 old cases of inflamed wrist. All these conditions were due to the way in which the miner used, or rather misused, his body while at work, and they were very different from miners' nystagmus, with its all-important psychological factor. In each, however, treatment had to aim not only at healing, but at completely restoring function. The most serious cause of accidents among miners was falls of roof, due largely to careless timbering while at work. Every colliery was called upon to provide facilities whereby such injured men could be removed to the nearest hospital. The mortality-rates experienced by coal-miners from various diseases, and from accidents, showed interesting differences on different coal-fields, and it had been observed that miners tended to be most dissatisfied with their working conditions on those coal-fields where the mortalities were highest.

In his second lecture Prof. Collis described the miners' welfare fund. This began, he said, in 1920 and depended upon a levy of 1*d.* on every ton of coal raised, which brought in about £1,000,000 a year. Since 1926 the fund had been augmented by a levy on royalties, in order that pit-head baths might be provided throughout the coal-fields. Baths of special construction were now springing up over the coal-fields, and were an advance on anything to be found abroad. They should go far to reduce the incidence of beat-knee, beat-hand, and beat-elbow, and boils in the hot mines, and should help to reduce muscular rheumatism, the great enemy of the miner.

Apart from pit-head baths four-fifths of the money from the fund was spent on the coal-field from which the levy came, and the remaining fifth was used by a central committee for purposes beneficial to the whole mining community, such as research into safety and health. A board of experts had been brought into existence, with an income of rather over £50,000 per annum, and this board carried out investigations for preventing explosions. They studied safety appliances and means for improving mechanical conditions below ground, as well as furthering research into conditions of health.

## INFECTION FROM MESS UTENSILS.

MANY years ago[1] Col. C. Lynch and Lt.-Col. J. G. Cumming, of the U.S. Army Medical Corps, contended that infection from sputum-borne diseases in the army was spread by dirty utensils rather than the barrack-room air, and urged the boiling of mess-gear. Dr. Cumming returns to this method in a further paper (*Military Surgeon*, reprinted in the *Jour. R.A.M.C.*, for February). To quote one of his evidences: of 21,411 civilians studied, 17,236 had their mess-gear washed at 91° C. by machine, and 20 per 1000 got influenza, while there were 103 cases per 1000 among the 4175 whose mess-gear was washed by hand at 44° C. Machine washing at 91° C. (195° F.) similarly reduced infection from diphtheria, mumps, measles, and pneumonia.

## A NEW TYPE OF LIGHT-SOURCE.

A BOOK entitled Artificial Sunlight[2] has an opening paragraph in the following style: "Nature is beneficent—life giving—but also ruthlessly destructive. Its eternal shower of blessings has not effaced or even dimmed the edict that only the fit shall survive." When an author starts thus and continues in more or less the same strain for nearly 30 pages, the reader is hardly prepared to find the carefully compiled mass of data bearing upon the measurement, reflection, scattering and absorption of infra-red, visible and ultra-violet radiations which follows this rhetoric. The data, which are drawn from a number of reliable sources, should be of the greatest value to readers concerned in many forms of quantitative work. The final chapters are on Electric Arcs and the Utilisation of Artificial Sunlight. The frontispiece of the book is an illustration of a new type of light-source and consists of a mercury arc between tungsten electrodes with a tungsten filament in parallel with the arc. Though the arc is enclosed in a bulb, it transmits ultra-violet radiation up to the wave-length 2800 Angstrom units and would appear to have claims upon the attention of radiotherapists.

## ANIMAL WELFARE.

THE first volume of an annual review of work in the cause of animals has just appeared.[3] The University of London Animal Welfare Society, which sponsors the book, is composed of undergraduate and graduate members of the University of London. The volume contains a series of signed articles and reviews. Mr. F. E. Hodgson surveys the history of the Parliamentary protection of animals; Prof. J. G. Wright supplies a report of the Poor Persons' Clinic at the Royal Veterinary College, and a note on the use of narcotics and anæsthetics. Various writers describe the state of animal protection in foreign countries, including the practice in the slaughter-houses, the use of animals in sport, amusement, and industry, and the state of the law and public opinion. A symposium on present-day problems includes discussion on the cruelties of the fur trade—with a list of firms where fur fabrics made of wool can be purchased—humane slaughter, the tragedy of diving-birds on oil-strewn beaches, and reforms needed in the trapping of rabbits. The book will be of interest to all who care for animals.

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*Corrigendum.*—Owing to a misunderstanding for which he was in no way responsible Dr. Gilbert E. Brooke was described as P.M.O., Sarawak, at the head of an article on Abolition of Bills of Health, in our issue of March 14th (p. 606). His appointment is that of chief health officer.

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[1] See THE LANCET, 1919, ii., 158.

[2] Artificial Sunlight. By M. Luckiesh, D.Sc., Director, Lighting Research Laboratory, General Electric Company, Cleveland, O. London: Crosby Lockwood and Son. Pp. 254. 16*s.* 6*d.*

[3] The Animal Year-book. Issued by the University of London Animal Welfare Society. Edited by C. M. Knight, D.Lit., and C.W. Hume, *M.C.*, B.Sc. Univ. of Lond. Press. 1931. Pp. 173. 2*s.*